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ctors and Engineers

magazine of modern construction

JULY 1954

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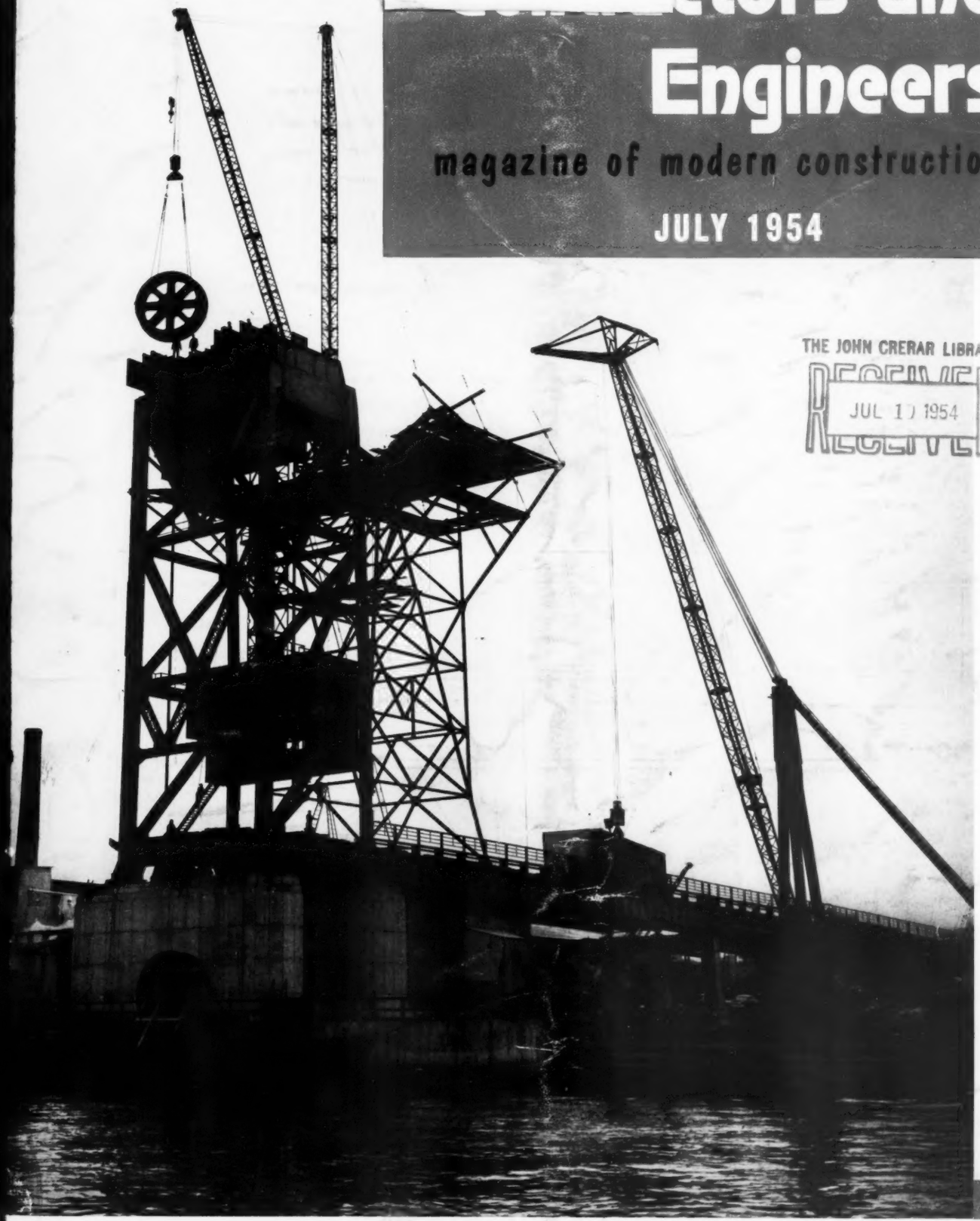

A 37-ton 15-foot-diameter sheave—forged, rolled, and welded by Bethlehem Steel Co.—is raised into position by a derrick for the Welfare Island-Queens lift span being built by the City of New York. Fabrication and erection of the bridge superstructure are being handled by Harris Structural Steel Co., New York, N. Y.

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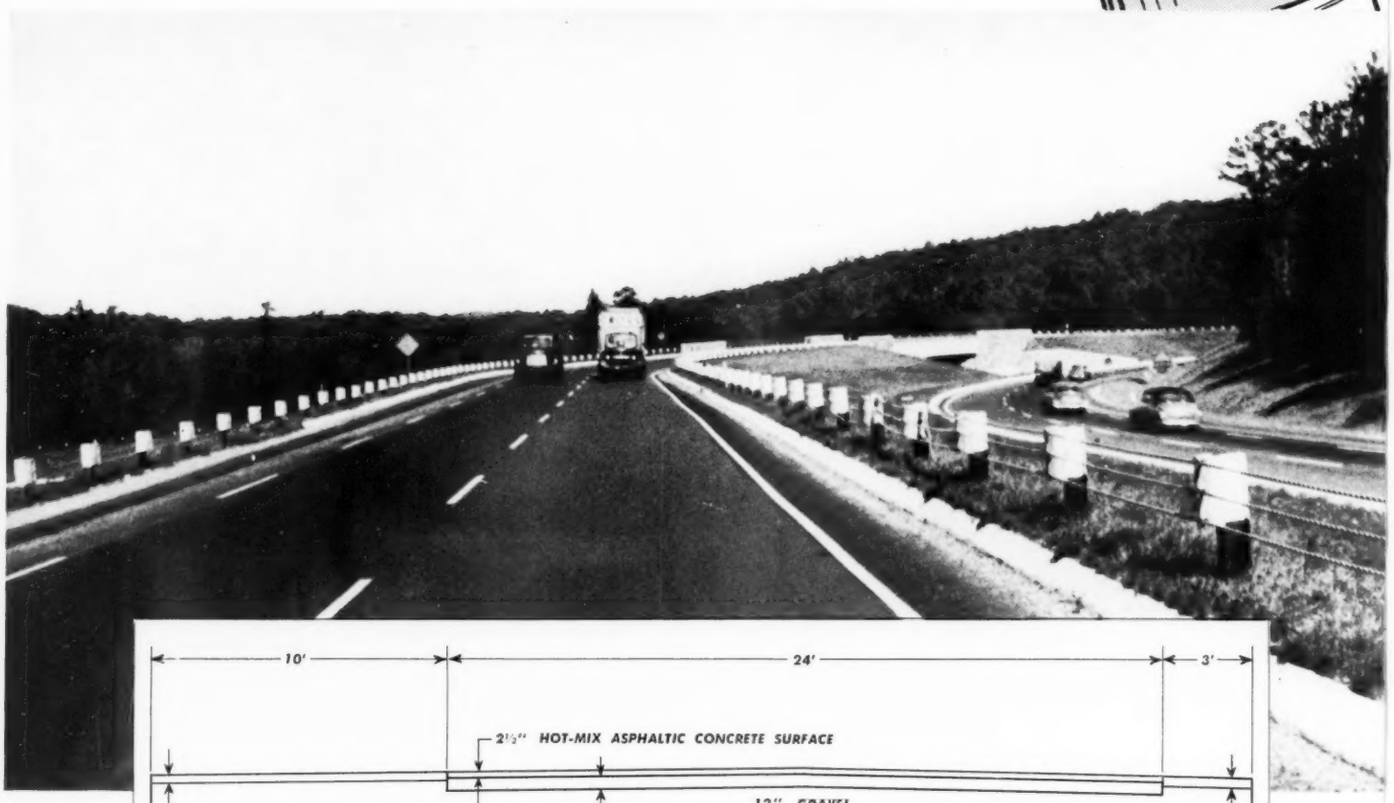
Massachusetts eliminates a highway bottle-neck

Boston to New York traffic now served by this modern, divided Texaco Asphalt highway



CROSS SECTION OF ROADWAY AND SHOULDERS FOR ONE HALF OF DUAL HIGHWAY

View of Massachusetts Route 15, now a dual highway south of US-20, with northbound lane showing at extreme right of photo. Paved with hot-mix Texaco Asphaltic Concrete on an Asphalt Penetration Macadam base.

This $3,000,000, three-year project was constructed under supervision of District Engineer Frederic W. Guerin of State Dept. of Public Works.

Texaco Asphaltic Concrete was laid by Bayer-Mingolla Construction Co., Worcester; asphalt was supplied by Wachusett Bituminous Products Co., Worcester.

The reconstruction of Massachusetts State Highway 15 from the Connecticut line to US-20 is one of the most notable projects in the history of this State's Department of Public Works. It took three years to complete the work and an expenditure of close to $3,000,000.

State Highway 15 is part of the principal route used by motor vehicle traffic between New York City and Boston. It serves an average of 16,000 vehicles daily.

This Massachusetts project merits special attention as an outstanding example of the use of Asphalt construction on a modern, divided highway, designed to serve today's traffic—and tomorrow's.

Each half of the dual highway has a 24-foot paved roadway, consisting of a 2½-inch surface of hot-mix Texaco Asphaltic Concrete on a 4½-inch Asphalt Penetration Macadam base, supported by a 12-inch gravel sub-base. Both shoulders, one 10-feet wide for parking and the other 3 feet wide, have a 3-inch Asphalt Penetration Macadam wearing surface. The median strip which separates opposing traffic, has a variable width, but not less than 34 feet.

Massachusetts announced recently that hot-mix Asphaltic Concrete over Asphalt Penetration Macadam will be used in the construction of its east-west Turnpike.

Traffic on the nation's most heavily traveled toll road, the New Jersey Turnpike, is served by the same type of Asphalt construction.

Toll road and State Highway officials cannot afford to overlook the important advantages of heavy-duty Asphalt construction. Asphalt's first cost is less than that of other pavements with the same load-carrying capacity. Asphalt has a lower upkeep cost, based on maintenance figures reported by a number of State Highway Departments to the Oklahoma Turnpike Commission.

Two helpful booklets on all types of Asphalt construction can be obtained without obligation by writing our nearest office.

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TEXACO ASPHALT

Contractors and Engineers

magazine of modern construction

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EDITORIAL

The Age of Power

From all indications, this country is entering upon a new era in the development of electric power—power which will turn the wheels of industry and strengthen the nation's economy. Last month we commented editorially on the giant strides of electric utility companies in constructing private hydroelectric projects. Another great source of power—the International Rapids of the St. Lawrence River—is now ready for utilization as part of the new seaway that will be built to provide the Great Lakes port cities with a direct outlet to the Atlantic.

The United States and Canada, joint sponsors of the project, hope to make a start on the construction this year, thus culminating more than half a century of vain attempts to turn the St. Lawrence into a seaway. As far back as 1895, a joint American-Canadian commission was appointed to determine how this great river system could be improved.

Dams will be built near Ogdensburg and Massena, N. Y., to harness the 46-foot drop in the river rapids, while powerhouses will convert the turbulent energy of the waters into approximately two million kilowatts of power capacity. The Great Lakes, a vast natural reservoir, should guarantee a continuing generating potential. Both nations, through the New York Power Authority and the Ontario Hydro-Electric Commission, are to share equally the construction costs and the electric power. In this country, private utilities will buy the power for distribution throughout New York, New Jersey, Pennsylvania, and parts of New England. Five years, according to the present optimistic estimates, should be long enough to complete not only the 114-mile stretch of seaway between Montreal and Ogdensburg to a navigable depth of 27 feet, but also the dams and hydroelectric plants. Even when power gets on the lines, experts predict, it will not meet the future demands for additional kilowatts in the northeast. More steam plants will be required to fill the needs of our increasing population.

This recognized requirement for future steam power should encourage coal operators and miners. For coal, along with oil and gas, will be burned to furnish steam to the turbines. In this regard, it is interesting to note that the coal interests are putting up a fight to prevent coal from being counted out as a competitor among fuels. It has been proposed that key rivers in the West Virginia-Kentucky soft-coal regions be canalized with locks and dams. Such improvements in water transport would undercut coal haulage by rail and perhaps put new life into a sick industry.

In the meantime, another new source of power is becoming practical. The first central-station atomic power plant in the country is to be built at Shippingport, Pa., near Pittsburgh. This pioneer nuclear power plant is a joint project of the U. S. Atomic Energy Commission and the Duquesne Light Co., with Westinghouse Electric Corp. developing and building the reactor portion of the plant under contract to the AEC. Duquesne Light will design and construct the turbine generator portion and operate the entire plant, which is designed to produce a minimum of 60,000 kilowatts. In an artist's preliminary sketch above, the cutaway view shows that the atomic reactor which provides the heat, and the heat exchangers which generate the steam, will be located underground in concrete and steel structures.

Hydroelectric power, steam power, and now atomic power. But to produce all this power, we must still build dams, locks, canals, and powerhouses: we must move mountains and dredge rivers. Civil engineering construction is needed in this age of power as it never was before.

NEWS AND VIEWS

At the halfway mark in 1954, it appears that everyone is agreed the depression, recession, or readjustment has been milder to date than anyone expected. Even though contract awards are still below last year, they are closing the gap fast. May saw the **largest award volume since January, 1953.**

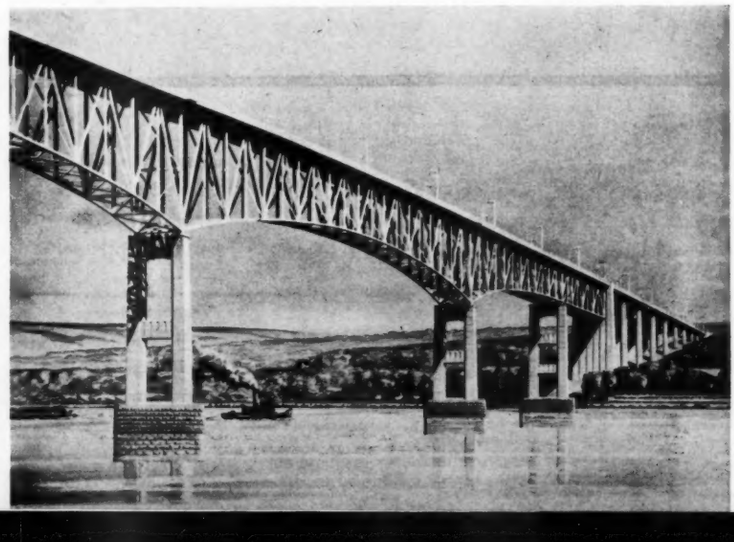
A healthy sign is that **steel production** is showing no signs of a usual seasonal lag. In the first quarter, steel for construction matched the 1953 figure for the same period. Shipments of fabricated steel for April came to 290,353 tons—a 25-year record.

Some sort of construction records should be set by the **St. Lawrence Seaway** before the $600 million project is finished, for allied projects are being rushed to the planning boards. Ohio is studying its **port facilities,** hoping to get financial aid from Congress for waterfront improvements which may run to $5 billion. **An inland waterway linking New York City and Canada** via the Hudson River and Lake Champlain is also being discused by U. S. and Canadian officials.

Under discussion in Pennsylvania is the new **federal-aid highway law** which will practically double highway construction grants to states. Federal allocation of $42 million to the state means that Pennsylvania "will not even be getting back federal gasoline and other excise taxes," according to C. H. Buckius, chief engineer for the state highway department. He estimates that residents pay $54 million and $75 million in federal gasoline and excise taxes, respectively. Arizona, New Jersey, and Idaho are among the first to propose **increased gasoline taxes to swell state matching funds** and thus secure more federal highway money.

More money for power is the chief concern of states in the northwest, where plans are being revived for the construction of Libby Dam on the Columbia River. This $263 million project will develop **more saleable power** than any other dam on the river. The Atomic Energy Commission, promoting the development of nuclear energy for the generation of electricity in the northwest, has five companies studying the possibility of building a nuclear reactor to produce more electric power.

A sketch of the proposed 7,793-foot-long bridge across the Hudson River, New York, designed by D. B. Steinman, Merritt-Chapman & Scott Corp., New York, N. Y., holds the substructure contract for the $4 million span, which is located just north of Kingston, N. Y.



Tilt-Up Method Cuts Cost on Overseas Job

Erecting technique with precast walls and roof panels results in 20 per cent saving over cast-in-place concrete

A precast concrete wall panel, cast on the floor slab, is tilted up by a Manitowoc Speedcrane at the U. S. Air Force base under construction at Goose Bay, Labrador. *U. S. Army Photo*

USE OF THE TILT-UP construction technique is expected to save more than $258,000 in building costs on a U. S. Air Force project being constructed in the Azores Islands by the U. S. Army Corps of Engineers. Army engineers have recently adapted the modern technique to the peculiar needs of overseas building programs.

At Lajes in the Azores, where nearly 100,000 square feet of air base office and shop facilities is under construction, the process of precasting concrete wall and roof panels and support sections and then lifting them into place with a crane, will save approximately 20 per cent of an original standard construction estimate.

The $984,956 contract has been awarded to the Fred S. Macomber Co., Los Angeles, Calif. The lowest bid for standard construction on the project was $1,243,295. Square-foot costs for the conventional process would have been $13.43 as compared to $10.64 for the tilt-up technique. In another phase of the Lajes work for which no contract has as yet been awarded, savings from use of the technique are expected to be an additional $118,000.

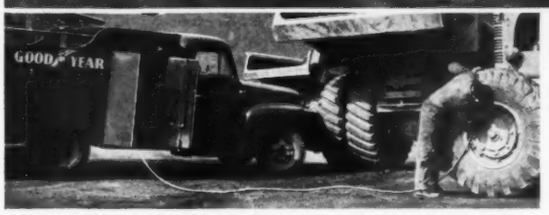
Two Designs

After the East Ocean Division's recent success with tilt-up precast-concrete construction at Goose Bay, Labrador, the Division adopted a policy of preparing two designs for buildings where tilt-up construction seemed feasible. This plan allows contractors to submit bids for construction by either the conventional steel - frame - and - concrete - block method or the tilt-up precast-concrete method.

In addition to saving $476,000 on a $2,682,000 project, engineers in charge of the Goose Bay project saved approximately 35 per cent of the time a conventional construction program would have required. A total of 280,000 square feet of warehousing was completed in a 15-week period.

Credit for the first application of tilt-up techniques in overseas defense building has gone to F. F. Newburg, Richmond, Va., who suggested the method and supervised its use on the Goose Bay job. A civilian employee of the Corp of Engineers, he was given the Army Efficiency Award in recognition of his contribution to overseas construction work.

The work at Lajes is under the supervision of Col. Herbert G. Lux, Atlantic District Engineer in New York, and Col. Peder Pettersen of Appomattox, Va., resident engineer in the Azores. THE END



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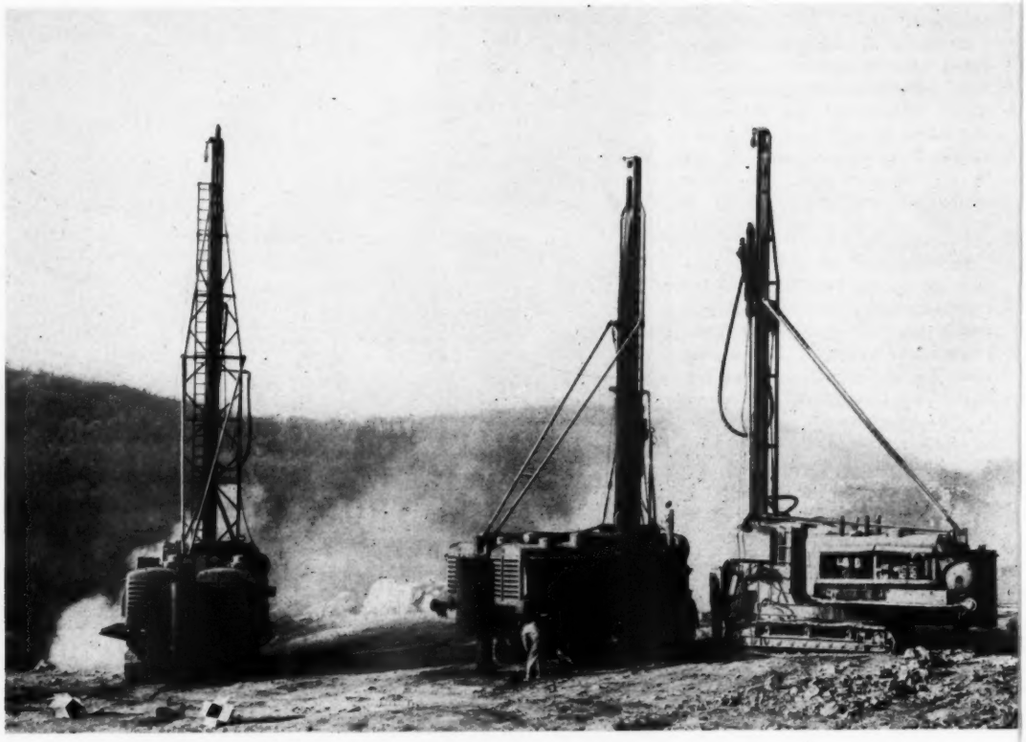
Clustered on the right-of-way, wagon drills and dust collectors work in a rock cut. Just beyond, a P&H shovel loads out broken rock. In the background, the thruway section stretches across the Ramapo Mountains.
C&E Staff Photos

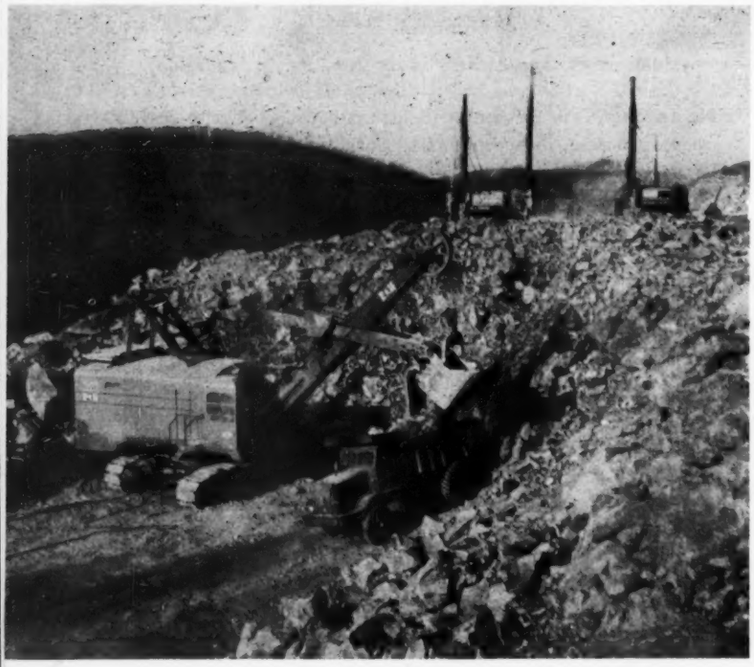
Big Equipment Fleets Spur Thruway Grading

Three contracting firms work on joint venture involving 3,000,000 yards of excavation on 13-mile mountain job

By ALBERT C. SMITH, Field Editor



To get big rock production, the joint-venture contractors used these I-R Quarrymasters to drill 6-inch blast holes where heavy excavation was required. The self-propelled units mount two compressors on the rear and a tower frame at the front.



Three Ingersoll-Rand Quarrymasters drill blast holes in one of the larger cuts as a P&H 6-yard electric shovel loads a waiting Euclid. Each drill rig averaged 100 feet of 6-inch hole in an 8-hour day.

WORKING ON ONE of the most rugged sections of the New York Thruway, joint-venture contractors moved more than 3,000,000 cubic yards of earth and rock last year in less than nine months. A crew of 600 men used some of the biggest equipment ever seen in the east to carve out 25,000 yards a day from the Ramapo Mountains, 30 miles northwest of New York City.

Everything about the job was big: the length was 13 miles and the contract price over $17,000,000. The quantities, too, were big. Nearly half of the 3,000,000 yards of rock was concentrated in a 2-mile stretch of mountain.

The combine itself consisted of three of the country's top outfits—Mt. Vernon Contracting Corp., Mt. Vernon, N. Y.; S. A. Healy Co. Inc., Chicago, Ill.; and M. A. Gammino Construction Co., Providence, R. I.

The big-equipment list was headed by P&H 6-yard electric shovels, Ingersoll-Rand Quarrymasters that drilled 6-inch blast holes, a stationary compressor plant that fed 6,050 cfm of air to 35 wagon drills, and a fully equipped machine shop that could make practically anything for a Euclid or a dozer.

Relocated River

Mt. Vernon-Healy-Gammino moved onto the job in May, 1953, to start work in several areas. Clearing and stripping had to be done along the entire length of the project and huge quantities of muck had to be removed in about seven different areas. In addition, the Ramapo River, which flows approximately parallel to the job, had to be relocated at eight points. Most of the work along the river was done with Northwest and Lima draglines.

On the big rock and earthmoving operations, the contractors faced several problems from the start. Part of the trouble was caused by the fact that the contractors were restricted considerably in their use of certain lands within the right-of-way. One of these was a golf course, extending completely across one area, which could not be disturbed for the first five months. This divided the job and, because

most of the big cuts were in the southern end, many of the hauls were longer than would ordinarily be necessary.

Another problem was the hazard facing equipment operators who worked near the 13,000-volt high-tension electric power line that ran the full length of the job. Until the line was finally moved out of the area, four months after the job started, all operators had to exercise extreme care to keep equipment clear.

Big Production

During the summer and fall when production reached over 25,000 yards a day, the entire length of the job buzzed with activity. The 2,300,000 yards of earth was moved by fleets of scrapers and also shovels and trucks. Six Caterpillar 20-yard scrapers and twelve LeTourneau 12-yard scrapers handled the bulk of the earthwork.

The most unusual aspect of the job was the speed at which the contractors removed nearly 1,000,000 yards of rock from mountain cuts 60 to 80 feet deep. One sidehill cut went as deep as 160 feet.

Fortunately, most of the rock was concentrated in a 5-mile stretch near the southern end of the job. There was so much rock in this one area that the contractors built a stationary compressor plant to feed air to the 35 wagon drills. The plant consisted of a Joy 2,250 cfm, a Joy 1,500 cfm, an Ingersoll-Rand 700 cfm, and two Ingersoll-Rand 800 cfm compressors. All these compressors were driven by General Electric motors. A total of 6,050 cfm was supplied to the area through 6 and 8-inch Naylor pipe. Portable compressors were used in the areas beyond the reach of the plant.

Quarrymasters

In the biggest cuts, blast holes were drilled with three Ingersoll-Rand Quarrymasters. The big self-propelled units mount two compressors on the rear and a tower frame on the front. Each Quarrymaster averaged 100 feet of 6-inch hole per 8-hour day. Quarrymasters drilled holes 30 feet deep on 11-foot centers. Carbide-tipped bits withstood about 700 feet of drilling through the hard magnetite.

The average shot required 8 or 9 lines, with 8 holes per line. Hercules 60 per cent dynamite, made in 4½-inch-diameter 16-pound sticks, was loaded to within 12 feet of the top of the hole and packed with earth. Shots were fired with Primacord to increase both speed and safety. Each line of holes was connected across the Primacord with three 9-millisecond delays. Shots were made about once a week and produced a dynamite factor of about one pound per cubic yard.

Wagon drills operated in a conventional manner, averaging better than one 22-foot hole per hour. Nearly 20 portable dust collectors were used in connection with the wagon drills.

Shovel Production

Shovel production in rock ran as high as 2,000 yards a day for each of the two P&H all-electric 6-yard units. The contractors also used one P&H 4½-yard, two P&H 3½-yard, two Lima 3½-yard, and four Northwest 2½-yard shovels, as well as a number of smaller units.

Big rock was hauled by a fleet of about 40 Euclid rear-dump trucks. Dozers leveled the dumps into 2-foot lifts. Fortunately, there was a sufficient amount of earth mixed with the rock in most areas to achieve good consolidation in the fills. Dozers were also kept busy maintaining haul roads for the big Euclids. Because of the sharpness of the rock, the contractor took special care to

(Concluded on next page)

Working beyond the reach of the stationary compressor plant, wagon drills are supplied with air by a portable Ingersoll-Rand Gyro-Flo compressor.

C&E Staff Photo

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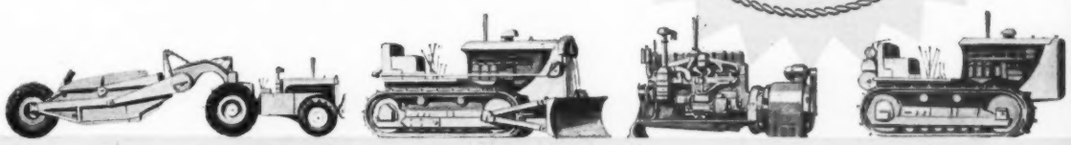

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DIESEL ENGINES • TRACTORS • MOTOR GRADERS • EARTHMOVING EQUIPMENT

(Continued from preceding page)

keep the big truck tires riding always on the smoothest possible haul roads.

Smaller rock and earth was hauled mostly by a fleet of about 35 Euclid bottom-dump wagons.

Maintenance

With nearly 100 Euclids, 20 shovels, and 45 dozers on the job, the maintenance problems were tremendous. But Mt. Vernon-Healy-Gammino had the staff to do the job. And the effectiveness of this program can be measured by the rate at which earth and rock were removed from the Ramapo Mountains.

To keep the huge fleets in top condition, the work was organized into three programs—lubrication, field repair, and shop repair. Lubrication crews were set up to process every one of the Euclids and dozers daily. During the day, a four-man crew operated from a Lincoln mobile lubrication rig to service all of the dozers. Another rig was used by the night shift to lubricate the Euclids. Both the end and bottom-dumps parked in four special areas at night so that the lubrication rig could process each of the units with a minimum amount of moving.

A diesel engine on one of the Euclids is overhauled in the main shop, which was equipped to repair, install, or overhaul virtually every piece of machinery on the job. Lubrication and field repair setups completed the three-pronged maintenance program.
C&E Staff Photo

Accurate records of each piece of equipment were kept on file in the mobile rigs. D-A lubricants were used exclusively on both Euclids and dozers.

Field repairing was another important phase of the maintenance program. Two mechanics, operating out of a service pickup, were assigned to each of the four job areas. With Motorola two-way radios, they were always in contact with headquarters and could quickly be dispatched to a disabled unit.

When the repair job was too big for the repair crew, the unit was brought into the main shop. Here, a staff of mechanics and machinists could install, repair, or overhaul almost any piece of equipment. The 40 x 100-foot building had four bays, each big enough to house a Euclid. A 17½-ton overhead crane ran the full length of the building.

Probably the most unusual feature of the maintenance setup was the fully equipped machine shop, a rarity on a highway job. It included an 18-inch lathe, a 100-ton hydraulic press, and machines for milling, shaping, cutting, drilling, and planing. Next to the shop, a Quonset hut housed the thousands of parts needed to keep the huge fleet rolling. At the peak of the job, nearly 40 mechanics were listed on the maintenance staff.

Personnel

J. G. McFall is project manager, T. Farone is superintendent, P. Fox is chief engineer, and R. Janks is rock superintendent for Mt. Vernon-Healy-Gammino. S. Jamba is master mechanic.

The work is being done for the New York Thruway Authority, headed by B. Tallamy, chairman, under the supervision of Clarke & Rapuano, New York, N. Y., consulting engineers for the design and supervision of section 6 of the thruway. Charles MacDonald is project engineer for Clarke & Rapuano.

THE END

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- bending
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IN SEVEN SIZES FROM 60 TO 400 TONS

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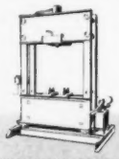
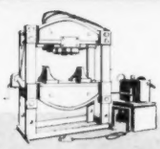
Request Catalog 313 B giving full details on Rodgers Shop Presses, Pumps, Cylinders, Accessories.



100 TON SHOP PRESS
Standard bolster—single acting cylinder—3-speed hand pump.



300-400 TON SHOP PRESS
Bolster cast alloy steel—single or double acting cylinder—power driven pumps.

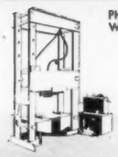


Photo courtesy Wm. H. Ziegler Co., Inc.

200 TON OPEN YOKE PRESS
Bolster cast alloy steel—machined surface—single or double acting cylinder—hand operated or power driven pumps.

Also makers of Forcing Presses — Tractor Service Jacks — Track Pin Presses and all types of Hydraulic Jacks.

Rodgers Hydraulic Inc.
7415 Walker Street, Minneapolis 16, Minn.

HYDRAULICS Rodgers KEEP THE WORLD MOVING

Servicised
CLEAR
Concrete Curing Compound

2 TYPES
- WAX-RESIN
- RESIN BASE

- Meet all official specifications for each particular type
- Do not alter appearance of concrete
- Dry rapidly . . . form clear, vaportight membrane

Servicised Clear Wax-Resin and Resin Base Curing Compounds are widely used for curing exposed concrete – pavement slabs, bridge structures, abutments, walls, etc. Sprayed or painted, they form a uniform moisture-retaining membrane. Available with fugitive dye to assist in proper coverage.

Write for complete details and circular on Servicised Concrete Curing Compounds.

SERVICISED PRODUCTS CORPORATION
6051 West 65th Street, Chicago, Illinois

Equipment Financing

To the Editor:

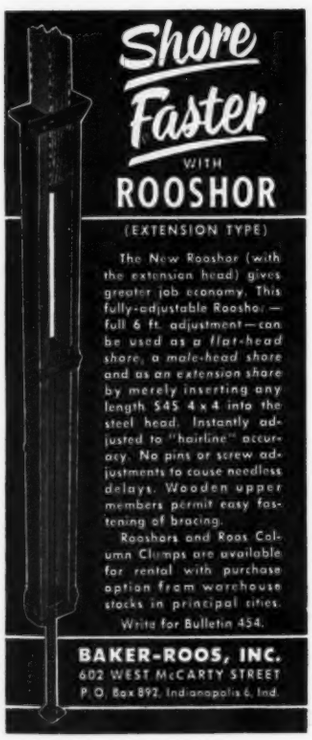
CONTRACTORS AND ENGINEERS

An article, "Equipment Financing", that appeared recently in your magazine implies that long-term financing of construction equipment can be done only through an industrial financing company. In the third paragraph of the article, you say "because of the limited time factor in repaying bank loans, and because suppliers extending credit must set their terms to meet their own needs, two of these methods may prove inadequate for the contractor."

You fail to point out to contractors that there are banks in the United States which make a specialty of long-term financing of construction equipment. This bank is one such institution. The Equipment Finance Department of the bank, working through our official dealers, has been acquiring contractor's time paper over the last four years with excellent results. In general, we offer our customers the same fine service as do the industrial finance companies, and we have every reason to believe that we do so at a cost to the customer that is usually cheaper than that charged by finance companies.

While it is true that short-term bank loans are not suited to the equipment financing needs of most contractors, there is nothing to prevent a national bank with sufficient capital and surplus from engaging in long-term industrial time sales financing on a basis competitive in every respect with the services offered by the industrial finance companies. I know this is a radical departure from general bank thinking of some years ago, but it behooves all of us in banking to try to find better ways of serving our friends in the business community.

Yours very truly,
R. M. Dowling
Assistant Vice President
The Franklin National Bank
Franklin Square, N. Y.



Shore Faster WITH ROOSHOR

(EXTENSION TYPE)

The New Rooshor (with the extension head) gives greater job economy. This fully-adjustable Rooshor—full 6 ft. adjustment—can be used as a *flat-head shore*, a *male-head shore* and as an *extension shore* by merely inserting any length 5/8 S 4 x 4 into the steel head. Instantly adjusted to "hairline" accuracy. No pins or screw adjustments to cause needless delays. Wooden upper members permit easy fastening of bracing.

Rooshors and Roos Column Clamps are available for rental with purchase option from warehouse stocks in principal cities.

Write for Bulletin 454.

BAKER-ROOS, INC.
602 WEST McCARTY STREET
P. O. Box 892, Indianapolis 6, Ind.

Air view of Caterpillar's new York, Pa., plant, with service building at rear.

New Caterpillar Plant Accents Dealer Service

With its York, Pa., facilities virtually complete and in limited operation, Caterpillar Tractor Co. this spring threw open the doors of this new plant and service center to the public. The dual-purpose facility includes a 770,000-square-foot plant for the manufacture of replacement parts for Caterpillar tractors, together with a regional storage and shipping center.

The establishment of the plant, according to its manager, L. C. Allenbrand, is in line with the company's emphasis on quality, backed by a responsible service organization. The factory section is producing Caterpillar tractor links, bushings, and shoes; the service section, located in a separate building, is serving the company's east coast representatives and all its export dealers except those in Hawaii, the Philippines, and Mexico. The location of this parts section means that four days will be cut off the shipping time formerly required to move parts from the Peoria, Ill., headquarters.

Southbound lanes of New York's Taconic State Parkway which features white concrete reflecting curbs.

Margin of safety for night drivers

Long-distance night driving is tiresome at best—it can be dangerous when roads are not clearly marked. That's why so many modern highways include this *extra* margin of safety . . . White Concrete Reflecting Curbs and Traffic Markers made with Atlas White Cement.

At night, the corrugated faces of these curbs catch and reflect headlight beams back to the driver. They provide a bright guide on curves, bridges, grade separations and traffic interchanges. Rain increases this "mirror action." Wet curbs give even greater visibility—when it's needed most. By day, the true white of Atlas White Cement stands in marked contrast to darker highway pavement.

More and more engineers are specifying White Concrete Reflecting Curbs and Markers for greater highway safety. Investigate it for *your* next project. For complete information, write to Universal Atlas Cement Company (United States Steel Corporation Subsidiary), 100 Park Ave, New York 17, N. Y.

ATLAS® WHITE CEMENT
For Concrete Reflecting Curb and Markers

A UNIVERSAL ATLAS PRODUCT

C & E-CB-78

UNITED STATES STEEL HOUR—Televised alternate weeks—See your newspaper for time and station.

Estimates Are Treated In Comprehensive Book

Complete information on the preparation of construction estimates, as well as a good deal of related material, has been put between the covers of a valuable new reference book, "Roche Estimating Methods: Construction Report No. 432", published by Construction Service, Inc. The book is the work of W. Earle Roche, Glendale, Calif., construction consultant.

The book treats in great detail such aspects of contracting estimates as construction costs, work investigations, and reports. In addition, there are sections devoted to public and labor relations, work programs and progress graphs, and construction materials and supplies. Sample estimates and reports, based on actual construction projects, are included.

General principles and procedures of estimating are discussed in the first of 14 sections, and the various items to be considered are listed in detail. The second section of the book is devoted to the construction industry—its history and evolution, major classifications, personnel, operation, and associated industries.

More detailed information on construction work is given a whole section, in which are discussed such topics as federal construction work, sources of information of projects, and classifying of costs, allowances, bids, and quotations. Work investigations and reports, work programs, and materials and supplies are treated in subsequent sections.

Three sections carefully detail the actual preparation of estimates, and there is complete information on summarizing and checking the estimates. A glossary of construction terminology used in preparing estimates, plans, contracts, and other reports or agreements is included.

The whole process of drawing up estimates is illustrated with reports from the records of specific construction jobs. Photographs of the work, reproductions of plans, graphs, estimate forms, and check lists, as well as explanation of the procedure followed are all used to develop the illustration. Such matters as equipment depreciation, factors that influence rental rates, and plant-use charges are discussed in detail.

Tables, diagrams, graphs, maps, and forms are found throughout the book. A center section gives complete tables on geometric figures and planes; trigonometric formulas and solutions; weights and measures; conversion factors; symbols for wiring plans, drawing, and map making; and other pertinent technical data.

Such legal aspects of construction work as the joint venture and articles of incorporation are treated and illustrated with sample agreements. Pricing of materials is discussed in relation to bids, estimates, and work schedules.

Besides the table of contents in the front, there are separate indexes preceding each section and a general index at the end. An easily followed cross-reference system is used throughout the book. Purchase orders for Roche forms are included in an appendix.

"Roche Estimating Methods: Construction Report No. 432" is priced at $100, which includes sales taxes and delivery charges to any place within the continental United States. The book may be ordered or further information obtained by writing to Construction Report No. 432, Roche Estimating Methods, 128 Western Ave., Glendale 1, Calif. The book has been printed in a limited edition.

"Maybe next time you guys won't forget the three-piece range rod!"

TEXACO

TEXACO

CONVENTION CALENDAR

August 30-September 3 National Shade Tree Conference
Annual Meeting, National Shade Tree Conference, Haddon Hall, Atlantic City, N. J. L. C. Chadwick, secretary-treasurer, Department of Horticulture, Ohio State University, Columbus, Ohio.

September 16-18 Western Assn. of State Highway Officials
Meeting, Western Association of State Highway Officials, Sun Valley Lodge, Sun Valley, Idaho. Earle V. Miller, state highway engineer, Boise, Idaho.

September 19-22 American Public Works Association
American Public Works Association, 1954 Public Works Congress and Equipment Show, Municipal Auditorium, Atlantic City, N. J. D. F. Herrick, executive director, American Public Works Association, 1313 E. 60th St., Chicago 27, Ill.

September 28-30 Southeastern Assn. of State Highway Officials
Annual Meeting, Southeastern Association of State Highway Officials, Andrew Jackson Hotel, Nashville, Tenn. Berrien W. Davis, secretary-treasurer, State Highway and Public Works Commission, Raleigh, N. C.

October 5-8 Ohio Short Course on Roadside Development
Ohio Short Course on Roadside Development, Departments of State Building, Columbus, Ohio. Wilbur J. Garmhausen, chief landscape architect, State Highway Department, Columbus 15, Ohio.

Germans Study U. S. Building Procedures

A delegation of 46 leading representatives of the building industry in West Germany visited this country in the spring to study American building methods and materials. During a 33-day tour of the United States and Canada, they inspected varied construction projects.

The tour was sponsored jointly by the *German Building News*, foremost German building trades publication, and the Central Association of the German Building Industry. In addition to studying methods and materials, the visitors met with representatives of the U. S. Army Corps of Engineers, the Foreign Operations Administration, and federal housing agencies in Washington, D. C.

As part of their inspection tour, the German builders observed the uses of plywood products in custom-designed homes, housing projects, and institutions in the Stamford, Conn., area. The group were guests of the Georgia-Pacific Plywood Co., New York, N. Y., and the Stamford tour was conducted by Joseph J. Peltz, president of Getman & Judd Co., Stamford, and Ernest Terlizzo, president of Homecraft Builders.

DUST CAN'T GET IN BEARINGS
PROTECTED BY TEXACO MARFAK, chassis bearings are safe from abrasive dust. Safe, too, from mud and moisture. *Texaco Marfak* stays *in* the bearings. You can't jar it out, you can't squeeze it out. It gives extra hundreds of miles of protection against wear and rust, adds greatly to the life of chassis parts.
In wheel bearings, *Texaco Marfak Heavy Duty* gives the same long-lasting protection against wear, rust and contaminants. It seals itself in, seals out dirt and moisture — and no seasonal change is required. Your bearing maintenance costs come down.
More than 500 million pounds of Texaco Marfak have been sold
Another effective, cost-reducing product is *Texaco Track Roll Lubricant*. It's especially designed to protect crawler mechanisms from dirt and moisture, wear and rust. A great life-extender for your rollers.
Let a Texaco Lubrication Engineer help you keep your jobs on schedule and your maintenance costs low. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write The Texas Company, 135 East 42nd Street, New York 17, N. Y.
ACO SIMPLIFIED LUBRICATION PLAN
educes to no more than six the number
ubricants you need for all major lubri-
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ey-saver. Ask your Texaco Lubrication
ineer for details.
Lubricants and Fuels
FOR ALL CONTRACTORS' EQUIPMENT

Advantages of Independent Tractors Teamed With Four-Wheel Scrapers

■ Literature from the M-R-S Mfg. Co. tells of the advantages of its four-wheel tractors over two-wheel tractors for loading scrapers. According to the literature, the M-R-S tractors have achieved the maneuverability of the two-wheel units with a light front-end and high drive-wheel traction, which makes it possible to use steering brakes in making short turns. The extra articulated joint also adds to turning ability.

A special weight-transfer feature that redistributes the weight of the loaded scraper to the tractor drive wheels is said to give traction approaching that of the crawler tractor. The use of low-pressure tires made possible by this design increases the normal ground-contact area. It is further pointed out that the four-axle design of the independent tractor and four-wheel scraper permits hauling at greater speeds on long hauls by reducing bouncing.

The M-R-S four-wheel tractors listed in the literature are rated at 196, 137, and 109 drawbar hp. The largest of these units, the M-R-S 190, is recommended as a prime mover to self-load units up to a 12-yard-struck scraper, or as a prime mover for up to a 20-yard-struck four-wheel scraper, pusher-loaded. These tractors are designed so that each major component may be removed for repairs without disturbing any other component.

To obtain this literature write to the M-R-S Mfg. Co., P. O. Box 1206, Jackson, Miss., or use the Request Card at page 18. Circle No. 732.

Hoist Classification Chart and Glossary

A hoist classification chart and a glossary of terms used by operators are available from the Hydraulic Hoist and Steel Dump Body Manufacturers Association. According to the association, the information contained in these publications has never before been compiled and made available in this form.

The hoist classification chart places all hoists in classes according to the torque rating in inch-pounds developed by the hoist around its hinge shaft. A table for determining the size or rating of hoist needed for a particular job also is included. Standard terminology is explained.

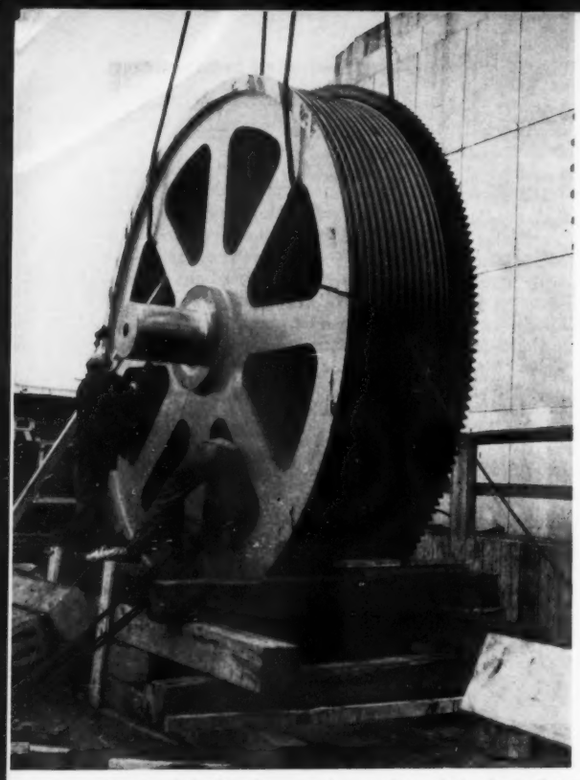
Copies of the chart and the glossary may be obtained by writing to J. R. Gorman, executive secretary, Hydraulic Hoist and Steel Dump Body Manufacturers Association, 1740 K St. N. W., Washington 6 D. C.

Iowa Mfg. Appointment

A new district sales representative for the line of Cedarapids aggregate-producing and bituminous-mixing equipment manufactured by Iowa Mfg. Co., Cedar Rapids, Iowa, is Don Gugler. His territory includes Michigan, Ohio, Indiana, West Virginia, Kentucky, and western Pennsylvania. He will make his headquarters in Columbus, Ohio.

Mr. Gugler, with Iowa since 1943, has served the company in various departments.

Derricks Set Huge Sheaves For 418-Foot Lift Span



As one of the big sheaves rests on a barge just prior to being hoisted, workmen polish the hub and remove anchor ropes. Grooves in the rim will hold counterweight cables. *C&E Staff Photos*

By WILLIAM H. QUIRK, Editor

THE SETTING of four giant sheaves for the new vertical lift bridge across the east channel of the East River in New York City was done in a matter of minutes. Guy derricks, atop each of the twin 170-foot-high towers, picked the 15-foot-diameter 37-ton sheaves from the deck of a barge and lifted them smoothly and swiftly into position. The sheaves look like any other bridge sheaves used on lift spans, but instead of being cast in one piece as are most big pulleys, these four "wheels" were fabricated through a combination of forging, rolling, and welding processes by the Bethlehem Steel Co., Bethlehem, Pa.

Casting a steel member the size of one of these sheaves is a delicate operation. If there is the slightest miscarriage, the work must be done over again, with a resultant loss of time and money. Because of the great developments in the art of welding, it was possible to take rolled sections of steel and shape them together into sheaves, the biggest that have been made to date in this manner. The members thus fabricated met all the rigid specifications required of conventional cast sheaves.

Forged Hubs

The hubs were forged on a 2,500-ton forging press and center-bored to an inside diameter of 22 inches at the Bethlehem plant of the steel company. For the web section, two rolled plates, 1¾-inch thick and 7 feet 3 inches wide, were welded together. The necessary cutouts were then made. Stiffener ribs of plate of the same thickness were welded inside the web to give it added strength.

The plates, as well as the rims of the sheaves, were rolled at Bethlehem's plant in Sparrows Point, Md. The rims are rolled plate 6 inches thick and about 3 feet wide. Following shipment to the Bethlehem, Pa., plant, the rims were cold-formed into semicircular shape and butt-welded to form a complete circle.

Sheaves, with centers 152 feet above water, are in place on the Welfare Island tower of the lift span. The derricks on both towers have 110-foot booms and 120-foot masts.

Crawler cranes, a floating traveler, and guy derricks handled superstructure erection. The derricks, working from temporary falsework, are guyed to the ground and to outriggers on the tower.

Steel pulleys to pass cables for concrete counterweights are made by forging, rolling, and welding processes

Then the web plates, with backup strips, were welded to the hub and rim. Both the hub and the rim were preheated with gas burners to a minimum of 200 degrees F and maintained at that temperature during welding to minimize cooling strains after welding. About 275 pounds of weld metal were used to fill the gap between the web and the rim.

The pipe burner used to preheat the rim was made especially for this job. The burner consists of two semicircular pieces of 3-inch-diameter pipe with two rows of holes for gas jets. The two halves of the burner were placed around the periphery of the rim and lighted. After welding, the sheaves were heat-treated to relieve any stress set up in the welding process. The sheaves were then moved to a machine shop where they were machine finished and had 12 cable grooves, each about 2½ inches wide, cut in their rims to hold the counterweight cables.

New Bridge

The new lift bridge, with an overall length of 2,600 feet, is being built by the City of New York to connect Welfare Island in the East River with the Borough of Queens. The island is a narrow strip of land, less than 1¾ miles in length and about 1,000 feet wide, situated in the middle of the East River between Manhattan and Queens. The two city boroughs are connected by the Queensborough Bridge which passes over the lower end of Welfare Island where a 7,000-bed hospital center cares for the aged and infirm of the city.

Welfare Island can be reached at present only by four big but slow-moving elevators that descend from the deck of the Queensborough Bridge. They carry an average of 640 cars a day, and the movement of these vehicles to and from the island causes numerous traffic jams on the heavily traveled bridge. The elevators have been in service 24

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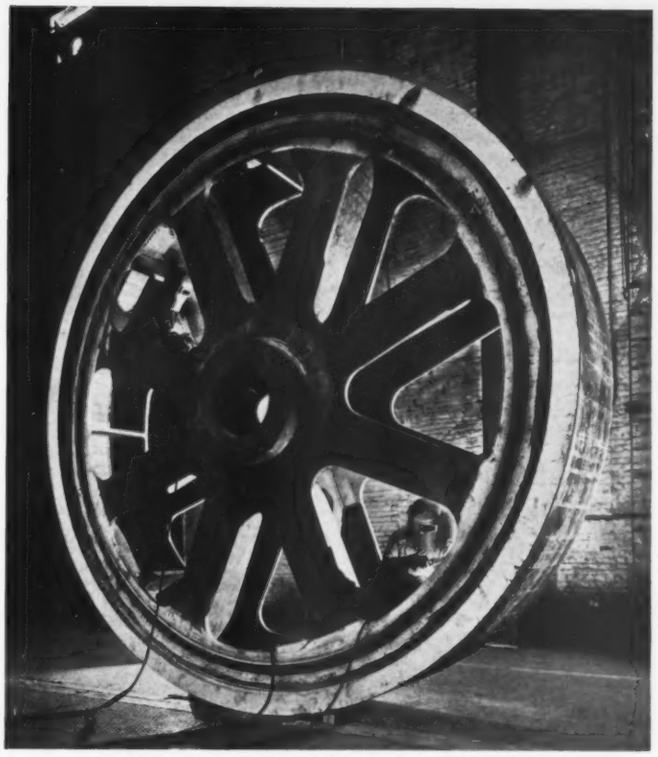
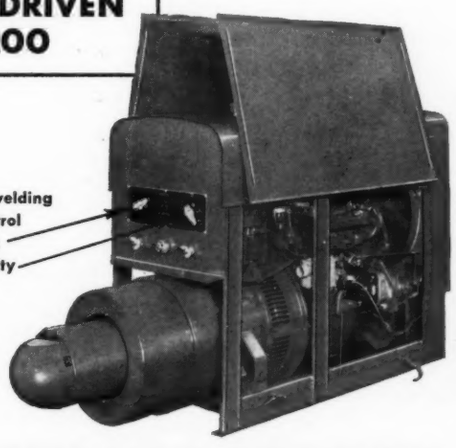


Welders in the Bethlehem Steel Co. plant in Bethlehem, Pa., work on one of the nearly completed sheaves used on the bridge. Three steelmaking processes—forging, rolling, and welding—played a part in the manufacture of the four giant sheaves.

"SHIELD-ARC" ENGINE-DRIVEN SA-200



CUT WELDING COSTS WITH RIGHT COMBINATION OF ARC AND INTENSITY

70 TONS OF REINFORCING STEEL *were saved by welding reinforcing column bars to cut costs $18,000 on Peninsula Hospital, Burlingame, California.*

"Shield-Arc" handles your on-the-job repairs and construction in less time . . . with less cost. Here's why:

1. It's easier to make quality welds. Dual Control sets *right type* arc and *right arc intensity* for every job. There's no compromise for speed, quality or ease of welding.

2. "Shield-Arc's" broad current range (40 to 250) permits quality welding of light or heavy work as well as hardsurfacing.

3. Low-priced. Built with Lincoln's famous heavy duty, industrial construction for long, dependable service . . . yet "Shield-Arc" sells for an amazing low price. See for yourself.

Compare "Shield-Arc's" money saving features and low cost. Bulletin 1337, giving cost-cutting details on Lincoln engine-driven welders, is available by writing on your letterhead.

THE LINCOLN ELECTRIC COMPANY
Dept. 5303 • CLEVELAND 17, OHIO
THE WORLD'S LARGEST MANUFACTURER OF ARC WELDING EQUIPMENT

TEAM UP THIS STANDARD STEEL S-J WITH A STANDARD STEEL TAR KETTLE FOR LOW COST ROAD MAINTENANCE!

STANDARD STEEL TAR KETTLES

✓ You get three separate operations from Standard Steel Tar Kettles. (1) Hand operated spray assembly; (2) Motor operated, and (3) Gravity Draw off for bucket work. Uniform heat throughout mass of material eliminates "cold spots" or "burnt materials." Team up an "S-J" and a Standard Steel Tar Kettle and you can handle any repair work or secondary construction at less cost—less work—with less investment in equipment. Write for Catalog "TK".

STANDARD STEEL "S-J" for SECONDARY CONSTRUCTION

✓ Whether used for construction of playgrounds, driveways, parking areas, or for patching, sealing, shoulder repair or crack filling, Standard Steel "S-J" works fast—economically — efficiently.

SAVES WORK — a special "SUCK BACK" element cleans spray bar instantly after shutting off flow of material.

NO DELAYS STARTING — pump and entire piping system is instantly drained after completing a job — eliminating freezing and loss of time on *starting next job.*

SAFETY — Gravity Draw off on curb side protects operator.

Write for Catalog "S-J" for Further Details

OTHER PRODUCTS

Asphalt Pressure Distributors, Patch Rollers, Supply Tanks, Tool Heaters, Asphalt Tools, Street Flushers, Construction Brooms and Aggregate Spreaders.

SJ6

Built to the Highest Standard

Standard Steel Works NORTH KANSAS CITY MO

(Continued from preceding page)

years, and they cost about $125,000 a year to maintain and operate.

Construction of the new bridge got under way in March, 1952, and is scheduled for completion by the end of the year. The early phases of the work were delayed considerably by strikes and material shortages.

Long Lift Span

Located slightly more than a half mile north of the Queensborough Bridge, the new $6,500,000 crossing will extend 2,600 feet from Astoria, in Queens, over the east channel of the river and the full width of Welfare Island to a road along the west shore of the island. Its 418-foot lift span will allow the maintenance of a river channel 400 feet in width. It will have a vertical clearance of 100 feet when fully raised, and 40 feet when seated. The 34-foot roadway will accommodate three lanes of traffic.

The main piers for the lift span were constructed in the river along each shore line. As the substructure was completed, the Harris Structural Steel Co., New York, N. Y., proceeded with the erection of the steel superstructure. For this work, the contractor used land-based crawler cranes, a derrick boat equipped with a company-built traveler having a 165-foot boom and 36-foot jib, and a pair of company-built derricks equipped with 110-foot booms and 120-foot masts. Lifting was done with American hoists powered by gasoline engines.

The latter pair of derricks, one on each side, did the bulk of the tower erection and also raised the sheaves into position so that their centers were 152 feet above the water. These derricks worked from the top of temporary falsework bents or platforms that were built up from the deck of the fixed portion of the bridge, directly behind the piers for the lift span. Guy-wire cables from the top of the mast extended to the ground and to outriggers at the top of the temporary tower, to give the derricks adequate support. Each derrick has a lifting capacity of 43 tons.

Electrically Controlled

Harris Structural Steel set the two 15-foot-diameter sheaves on the Welfare Island side first, then moved across to the Queens side and set the remaining two. The lifting of the heavy 37-ton members by the big derricks was accomplished quickly and easily. Over each of these sheaves will pass 12 steel cables, each having a 2⅜-inch diameter and a breaking strength of 200 tons. The cables will carry two 515-ton concrete counterweights, one at each tower, which will approximate the 1,000-ton weight of the lift span.

The lift span is now being assembled on two barges near the bridge site on the Queens shore. Sometime this summer, the barges will float it into position between the two lift-span towers. Then the 48 cables passing over the sheaves will be attached to the ends of the span, and the final 418-foot link of steel will be raised into place. This concluding phase iin the steel erection is expected to take two days.

A single operator high in the east tower on the Queens side of the structure will operate the lift span. Powered and controlled by General Electric equipment, the span will be capable of reaching maximum height in 1½ minutes. The actual rise between the twin towers—60 feet—will afford ships a 100-foot clearance. Two G-E motors, each rated 125 hp, will drive the hoist mechanism, and power-selsyn units of the same rating will assure synchronous operation.

Besides the drive motors and con-

Representing Harris Structural Steel Co. on the $6,500,000 bridge project are John Schnier, manager of erection, and Charles Haag, job superintendent. The rim of a sheave is visible in the background.

THIS Caterpillar HT4 Shovel feeds a 1500-lb. hot batch asphalt plant and loads trucks for Ideal Asphalt Paving Co., Inc., near Las Vegas, Nev. Plant production averages 500 tons per eight-hour day. This HT4 has loaded as much as 1300 tons of gravel in the same period of time!

The versatile CAT* HT4 Shovel can earn its keep at many tasks: bulk material handling, grading, excavating, light bulldozing, cleaning up. It's compact and maneuverable for work in tight places. Hydraulic controls are precise and fast-acting, and permit simultaneous raising and dumping of the 1¼-yd. bucket. Because it's designed as a unit, with the weight of the bucket evenly distributed along the full length of the tracks, it will not "dance," even with a full load.

Rugged construction is an important reason for the HT4's high work output. It's built to withstand extreme stresses and stay on the job year after year without costly down time. Carefully designed filters and seals protect the machine's Caterpillar-built precision. They keep oil and lubricants *in*, and harmful grit *out* of the engine and hydraulic system.

Ideal Asphalt is predominantly equipped with Caterpillar-built machines. They own two HT4 Shovels, a D7 and two big D8 Tractors, and three Caterpillar Diesel Engines. "We think we can make more money with the big yellow machines," says Mark C. Whiting, company treasurer. "They're dependable, and we can get parts and service when we need them. Our dealer service is the way we like it."

Your Caterpillar Dealer can give *you* the same kind of service. Ask him for black and white *proof* that the Caterpillar HT4 Shovel will do *more* work at *less* cost on *your* job than any other shovel of its size.

Caterpillar Tractor Co., Peoria, Ill., U.S.A.

CATERPILLAR*

*Both Cat and Caterpillar are registered trademarks—®

NAME THE DATE... YOUR DEALER WILL DEMONSTRATE

trol, General Electric is supplying two 30-hp emergency drive motors, limit switches, brakes, panel boards, and other auxiliary equipment for the structure. Electrical installation is handled by the Jandous Electric Construction Corp., New York, N. Y.

Personnel

The entire bridge project is coordinated by the Department of Public Works, City of New York, of which Frederick H. Zurmuhlen is commissioner. Consulting engineers are Knappen-Tippetts-Abbett-McCarthy, represented on the job by Kenneth B. Wolfskill, engineer.

Representing Harris Structural Steel Co. are John Schnier, manager of erection, and Charles Haag, job superintendent. Edward L. Guerber is chief engineer. THE END

Engine-Hour Meter Helps To Schedule Maintenance

■ Literature from the John W. Hobbs Corp., 2067 Yale Blvd., Springfield, Ill., discusses the advantages of the company's engine-hour meter in decreasing equipment downtime. The engine-hour meter, which is not a revolution counter but actually records the hours and minutes of engine operation, gives what is considered to be the most reliable basis for scheduling protective maintenance and lubrication of equipment. The meter requires a battery as a source of power supply, and the meter model for any particular installation depends on the voltage of the battery used.

The Hobbs engine-hour meter has been used on crawler tractors, motor scrapers and graders, diesel-powered shovels and excavators, trucks, engine-driven electric generators and air compressors, material-handling equipment, cranes, dredges, road rollers, ditchers, and trench diggers. It is available in standard and flush-mounting types for voltages ranging from 6 to 115 volts. Models with a special brake mechanism that provides split-second timing are also offered.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 800.

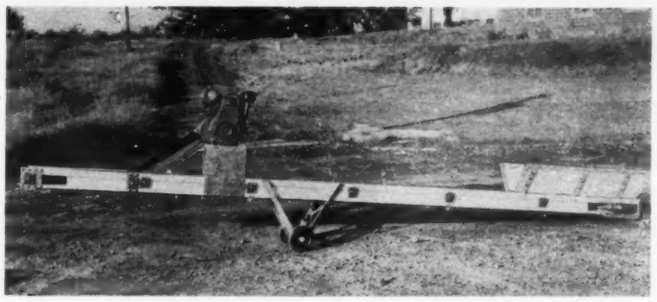
Book on Prize-Winning Welded Bridge Designs

Detailed studies, in text and diagram, of welded and riveted bridges are contained in a new book, "Comparative Bridge Designs", published by The James F. Lincoln Arc Welding Foundation. The material presented in the book was edited by Prof. James G. Clark of the University of Illinois from designs entered in an award program sponsored by the Foundation.

The designs cover various types of bridges: continuous girder, with or without floor beams; simple beam spans; simple trusses; continuous trusses; and arches. Welded and riveted designs are compared to illustrate the savings possible through use of the former method. Original drawings by the designers are reproduced.

"Comparative Bridge Designs" is priced at $2 in the United States and $2.50 elsewhere, and may be ordered directly from the publisher: The James F. Lincoln Arc Welding Foundation, Cleveland 17, Ohio.

All-Aluminum Conveyor for Concrete and Sand



The new Farnco Model C-C all-aluminum conveyor handles concrete and soggy sand.

■ A new all-aluminum conveyor for handling concrete and soggy sand is offered by Farnco Sales Co., 6713-15 Formosa Way, Pittsburgh 8, Pa. In the Farnco Model C-C conveyor, the leakage and material-loss problem has been reduced to a minimum by flashing the entire length of the belt with rubber. A deep hopper catches the material.

The extruded aluminum conveyor, with its bent-bar inside construction, is designed to resist twisting on long hauls and reportedly can take more than normal pounding.

The Farnco C-C conveyor is powered with a gasoline engine, with air, or with an electric motor. Belt width is 16 inches. The entire wheel assembly can be removed, allowing the unit to reach into narrow or small openings.

For further information write to the company, or use the Request Card at page 18. Circle No. 684.

Fairbanks, Morse Appointee

R. H. Morse III has been named assistant to the vice president in charge of sales for Fairbanks, Morse & Co., Chicago, Ill., manufacturer of pumps and construction equipment.

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MID-WESTERN INDUSTRIES, INC. 1009 S. WEST ST., WICHITA, KANSAS

A Caterpillar D4 tractor mounting two Gardner-Denver wagon drills moves along the line of excavation. The two machines, mounted 60 inches apart on a rigid framework, drill blast holes in the hard rock.

After blasts have broken up rock in the ditch line, a Bucyrus-Erie 15-B drag shovel mucks the blasted material and prepares the trench. The excavated material is stockpiled along one side of the ditch.

Rocky Terrain No Problem

Proper organization of workmen and machinery enables contractor to complete 70-mile project in 4 months

Good Coordination between the various crews, as well as the right combinations of equipment, paid off in production speed last winter as R. H. Fulton & Co., Lubbock, Texas, constructed a 70-mile-long natural-gas pipeline in southwestern Texas. In spite of rocky terrain and other delaying factors, the contractor pushed production at an average speed of 1½ miles per day.

This stretch of 20-inch pipe forms a main artery in the Permian Basin Pipeline Co.'s gas transmission line. The Permian company, a subsidiary of Northern Natural Gas Co., Omaha, Nebr., provides more than a billion cubic feet of natural gas daily for consumers in the north central states.

Permian's $42,000,000 over-all plan for expansion of its facilities includes construction of four compressor stations, two dehydration plants, a sulphur-removal plant, a plant for the removal of carbon dioxide, a gasoline plant, and 234 miles of pipeline. The 70-mile link built last winter by Fulton is located between the Plymouth compressor station and the city of Fort Stockton, and is one of the last phases of the program.

Hard rock along the route of excavation, blowing dust, and winter temperatures were among the adverse conditions which plagued Fulton during this four-month job. In addition, truck delivery of the 40-foot lengths of pipe was complicated by the Texas limit of 45 feet on highway vehicles.

Rapid progress was the rule rather than the exception, however. In one 10-hour day, for example, production included clearing of two miles of right-of-way, 25-per-cent completion of a 357-foot river crossing, stringing of 27,000 feet of pipe, installing of 10,000 feet of pipe, and lowering in of 20,000 feet of pipe.

Begun late in October of 1953, the job was completed early this year. The whole project was well organized. Construction headquarters were in the town of McCamey, about midway through the route of the pipeline. In chronological order, construction steps included: preparation of the right-of-way, building of a crossing on the Pecos River, excavating of the ditch, stringing of pipe, installation of pipe, hot pass and stringer bead welding, filler bead welding, cleaning and priming, doping, lowering-in, backfilling, and cleanup.

Field operations were under the general supervision of the spread superintendent, Oscar Phillips, a veteran of 18 years with R. H. Fulton & Co., and a man who knows how to run a tight pipeline spread. Phillips is one of the old gunners of the pipeline business; he has run every machine and supervised every foreman's spread in the years covered by his experience. Interesting from his viewpoint is the dope gang's work, which he calls the toughest part of a job. Lowering-in is the easiest and most pleasant, he claims.

Right-of-Way

An illustration of how fast the project moved is the right-of-way clearing operation. Permian Basin

PIPELINE CONTRACTORS SPECIFY...

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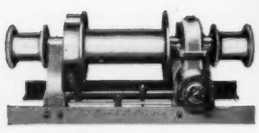

This contractor's truck mounts a Model 23 Tulsa Winch. The earth auger is powered forward with a Model 19 Tulsa Winch.

Contractors everywhere choose Tulsa Winch to lighten their equipment-moving jobs. Tulsa Winches are available in 28 models, in capacities from 6,500 to 80,000 lbs., for every model and make of truck or crawler tractor.

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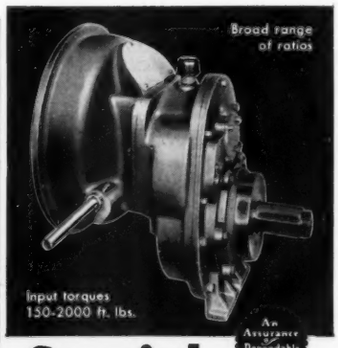

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Welders make the initial stringer bead and hot passes along a length of pipeline. The tack welding trucks carry 300-amp Lincoln diesel machines. Pipe lengths were rolled in the Milwaukee shops of A. O. Smith Corp.

An M. J. Crose cleaning machine, powered by a Continental engine, passes along the pipe removing rust and mill scale. A Caterpillar D8 tractor with Trackson pipelayer side boom supports the pipe.

...blor Fast Pipeline Crews

By RAY DAY

Pipeline Co.'s easement through the flat and rolling Texas range included a 60-foot strip, which was covered with mesquite and other desert flora. This growth had to be stripped, piled, and burned, and in addition, any sharp breakaway terrain had to be leveled so that trucks and other equipment could use the right-of-way.

Right-of-way equipment included one Caterpillar D7 dozer, a Gardner-Denver 300-cfm compressor, and two small pneumatic drills in case any blasting was necessary. The right-of-way operation was done in four basic passes, in which the brush was stripped, the topsoil was leveled, necessary grading was done, and the final pass was made to dress the strip. Passenger automobiles can get to almost any part of this pipeline installation.

Ditching

The ditching assignment was a combination of some exceptionally hard work and some easy digging. In the easy phases, a trenching machine often made 8,000 to 10,000 feet per 10-hour day. In hard digging in lime and flint rock, it was necessary to use wagon drills, high air-compressor capacity, and backdiggers to gouge out the formation. Specifications called for a minimum of 28 inches on the ditch bottom, with cushion material where necessary over jagged rock, A minimum of 30 inches of cover also was specified as backfill over the pipe, which will operate under about 850 psi pressure.

The ditch generally was excavated to a depth of 4½ feet. All the soft trench digging in anything but hard rock was handled by two Cleveland 320 ditching machines, equipped with endless buckets and H&L digging teeth. It was customary for both of these machines to make long runs, and turn in high production. About 50 per cent of the job was composed of such easy digging, while about 50 per cent consisted of hard drilling and shooting. Some stretches, of course, were a combination of the two, and in these cases, the Cleveland machines picked up all the loose digging from the top part of the trench, while drilling crews followed them closely.

It is customary in bidding on such a pipeline job for the contractor to bid on the basis of ditch digger excavation. When solid rock which requires drilling and shooting is found, the pipeline company pays for a full solid rock ditch between the stations where it is found, at so much per cubic yard. This arrangement protects both the pipeline company and the contractor. The pipeline business is singularly free from excess contingent costs in bids.

Hard rock ditch excavation on this job was handled by two Gardner-Denver 600-cfm compressors and one Gardner-Denver 500-cfm machine. Drilling equipment consisted of twin sets of Gardner-Denver wagon drills, mounted on a rigid framework which placed the machines 60 inches apart. This framework was then suspended from a D4 tractor-mounted side boom, and the tractor

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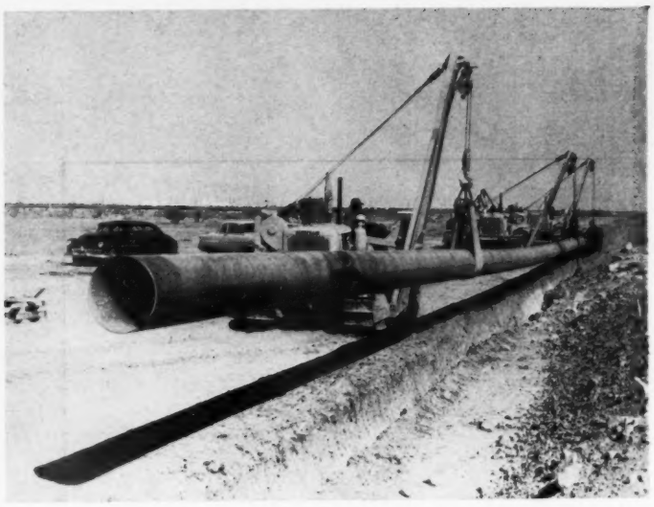
Still supported by the Trackson side-boom combination, the pipe is treated by a dope gang working with an M. J. Crose machine. The dope is prepared and carried in a Littleford heating kettle.



Caterpillar tractors with Trackson pipelayers lower the pipe into the trench. A small labor crew has prepared the trench by placing cushion material over blasted rock edges and smoothing down the grade.

was also used to tow the compressor. Each unit was highly mobile, self-contained, and dependable.

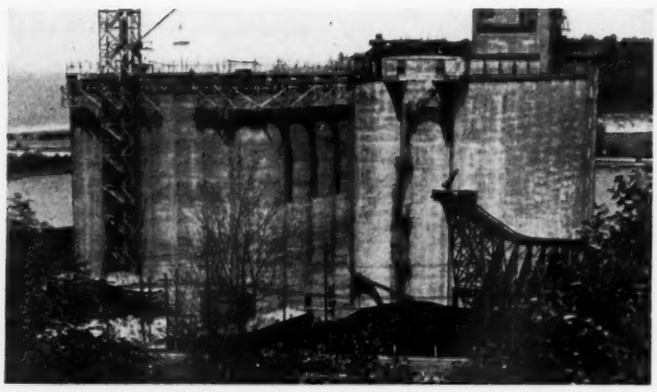
In ordinary caliche rock, the formation was broken up by line drilling the center line of the ditch, going about 12 inches below grade, and placing the holes on 30-inch centers. Where harder flint and lime rock was found, it was necessary to turn the twin-drill mounting so the holes would go down closer to the sidelines of the trench. This automatically staggered the holes along both trench edges.

Timken steel and ordinary Timken rock bits were used for this operation. Bits were discarded only when they were worn out. Gelex Extra D and Du Pont 40 powder were used. From ½ to ¾ mile was often shot in one explosion. Crews pulled the shots with the help of Primacord detonating fuse. The shots were arranged by stringing a trunk line of Primacord down the center of the ditch, and knotting the lead-ins from the various holes over the main line.

Since each of the twin mounted Gardner-Denver drills accounted for about 1,000 linear feet of ditch in a 10-hour run, there was ample drilling capacity to take care of about 3,000 feet of rock ditch per day. By scheduling this operation wisely, Superintendent Phillips kept ahead of his pipelaying crews.

After the various blasts had been fired, the broken rock was mucked out by a pair of backhoes and a Bucyrus-Erie 15-B backdigger-type drag shovel. These three rigs accounted on an average for 2,000 feet of ditch excavation per 10-hour shift, or approximately 650 feet apiece. The material was stockpiled along one side of the trench, leaving

204 "CONCRETOR" HYDRAULIC JACKS RAISE 98-FOOT STORAGE ANNEX IN CANADA



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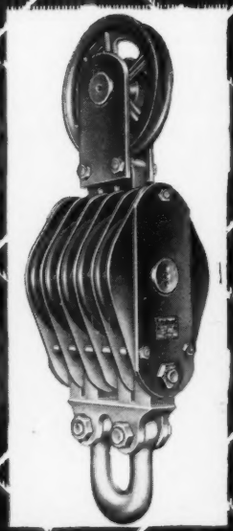

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the other clear for pipeline stringing to follow. The ditching work moved ahead smoothly, and when Phillips found it necessary, he did not hesitate to schedule night drilling and other operations which would keep the ditching work ahead.

High-Speed Stringing

The 40-foot pipeline joints, which have .280-inch steel walls and are designed to stand normal pressures up to 1,000 psi, were rolled in the Milwaukee shops of A. O. Smith Corp. They were supplied to the job by Permian. It was not at all unusual for crews to handle from 50 to 60 carloads a day, each load consisting of 22 joints.

Rail sidings at Plymouth, Rankin, McCamey, and Girvin, Texas, all on the Santa Fe railroad, were used to bring in the material. The Fulton organization owns its own fleet of pipe-stringing trucks, which for this spread consisted of eight Ford F7's. These machines delivered pipe to the job site, each carrying a load of six joints per trip. A Cat D4 and side boom at the rail point handled pipe from the cars to truck beds.

Stringing crews chalked up some impressive performance records. In one hectic 10-hour day, the eight trucks strung 27,000 linear feet for an all-time company record. As pipeline jobs go, this one did not require excessive back stringing or bending. Project officials estimated that a third of the job or less involved bent sections.

Pipe Installation

Pipe installations moved with the regularity of clockwork. Equipment on this phase of the job included two D7's with Trackson pipelayer side booms and two tack welding trucks each carrying two Lincoln diesel 300-amp machines. This operation was run with two stringer bead welders. The crew included two spacers, a stabber, a skid setter, two drivers, a pipe buffer, two swampers, two bead cleaners, and a truck driver. Three hot pass welders followed closely behind this crew.

Each pipe joint was picked up on 4 x 4 oak skids by the two D7's and moved into position at the previously placed joint. The machines held the pipe while the welders made the initial stringer bead pass. A clean-out tool was inserted and pulled through the joint to remove all loose sand.

The initial stringer bead, which joins the sections together, was run with Lincoln Shield-Arc 85 electric welding rod in 5/32-inch size. This bead was sunk deep between the buffed V of the joint. A hot pass was put on immediately afterward with the same welding rod.

Rented Welders Used

Filler bead welding consisted of

(Concluded on next page)

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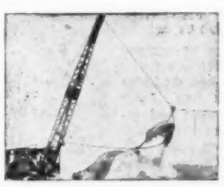
Sauerman engineers will quote you on the largest size Crescent Scraper your dragline can handle. Just give us the make, model number and boom length.

Above: Boom machine has a boom length of 110 feet and uses a 4-cu. yd. Crescent scraper, replacing a 2½-cu. yd. dragline bucket.



Above: A 1½-cu. yd. Sauerman Crescent used with a 1-cu. yd. dragline is lifted clear of the levee and returns to the borrow pit by gravity at 1500 fpm.

Write for: *Field Report 219, Scrapers with Boom Machines and Catalog J, Scraper Buckets.*

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(Continued from preceding page)

three passes of Shield-Arc 85 rod in 5/32-inch size. For this operation, six privately owned and operated Lincoln welding machines were used. Each of the six machines completed about 33 joints per shift, or a total of about 215 to 220 joints per day.

About 15 per cent of the welded joints were X-rayed behind the pipelaying crew. This examination was sufficient to check on the average workmanship, and to make sure that an excellent welding standard was being maintained.

Pipe Is Coated

Before the pipeline was lowered in, it underwent cleaning, priming, and coating with enamel and spun glass as protection against the ground elements. For cleaning and priming, there was a D8 with a Trackson pipelayer and rolling cradle which picked up the pipe from its cribbing and supported it in midair while an M. J. Crose cleaning machine passed by. With the exception of a small amount of mill scale and very little rust, the pipe was usually in excellent shape by the time this machine rolled by.

The Crose machine also applied a coat of Barrett coal tar primer as it moved along. Three Littleford hot pots were available for this machine and for the dope machine which followed. The dope machine, also an M. J. Crose rig, moved along with temporary pipe-support help from a D8 and Trackson side boom.

The dope gang covered from 6,000 to 9,000 feet per day, putting on the permanent coating of dope and Fiberglas. The 3/32-inch dope protection consists of 3 parts of Barrett PL enamel, and 2 parts of Pittsburgh modified bitumastic material.

Immediately following the application of dope, two D8's and a D7, all with Trackson pipelayers, moved in to lower-in the finished pipe. By the time these machines came along, the bottom of the trench had been worked over by a small labor crew, which placed cushion material over blasted rock edges and smoothed down the grade in earth areas. The three tractor-mounted side booms finished the installation job with the lowering-in operation. Two utility truck-mounted welders made necessary tie-ins where the line intersects a utility. In general, pipe strings ran from 3,000 to 6,000 feet between these ties.

Backfill was placed by a D8 and a D7, both equipped with dozers. The machines left excess material nicely rounded over the top of the pipeline as they replaced the uncompacted material. A scavenger truck picked up debris such as powder boxes and oil cans.

Long runs of pipeline were cleaned inside after the job was finished. This operation entailed pushing a pig (a heavy-duty cleaning tool) under pressure of about 15 psi through the line.

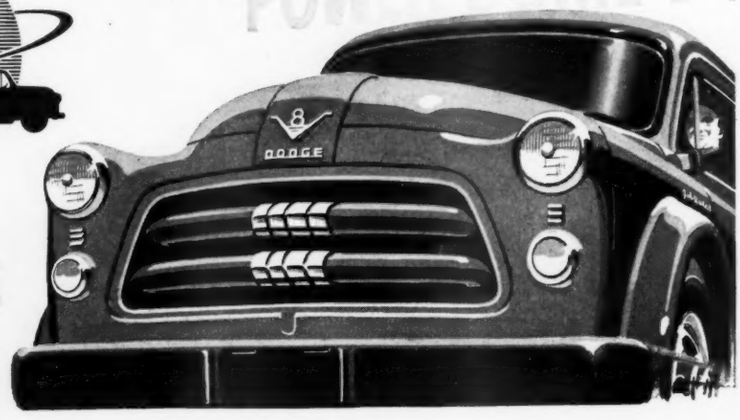
River Crossing

One of the features of this project was a difficult 257-foot crossing on the Pecos River. At the time this was made, the river was about 50 feet wide and 4 feet deep. The river was by-passed temporarily through four joints of 26-inch pipe, and the bottom dried up so equipment could get in. A pipeline ditch was then excavated by a Schield Bantam 3/4-yard truck-mounted machine, which worked behind a 5-foot earth dike thrown up by dozers. Some 2,215 sand bags protected the dike face from erosion, and helped to train the water through the by-pass pipes.

Pipeline for this crossing consisted of exceptionally heavy 7/8-inch wall steel which was protected by wrapping each joint with sheet rock and banding it in steel. The heavy joints were installed, welded, and backfilled, after which the temporary river control measures were removed. The entire operation took only four days.

Oscar Phillips' supervisory gang for R. H. Fulton & Co. included Woodson Gills, right-of-way; Howard Laquay, ditch; Albert Decker, stringing; J. H. Lofton, pipe installation; C. D. McGinnis, welding; M. L. Persons, dope gang; Luther McBayer, lowering-in; Lewis Josey and Kenneth Legg, mechanics; and Jerry Short and Mickey Sanderson, office management. THE END

POWER-DOME V-8
POWER-DOME V-8
POWER-DOME V-8



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Never before in history has there been a truck engine like this! The new Dodge truck Power-Dome V-8 gets full power from regular gas, offers more miles to the gallon, operates at higher efficiency than any other mass-produced V-8! See your dependable Dodge truck dealer *today!*

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Thrifty-powered Dodge truck 6's, too!
Famous-for-economy 6's also are found throughout the Dodge truck line. Twin carburetion and increased horsepower on many Dodge truck Sixes! Known everywhere for dependability.

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A BETTER DEAL FOR THE MAN AT THE WHEEL

Perfect Precision for Builders

KERN GKO Level

The small, simple but strongly built level, specially designed for building site work.

The instrument is equipped with mirror for bubble reading, tilting screw, jointed tripod head, and both bulls eye and 40 second tubular level. Internally focusing telescope—18x magnification. All optics AR Coated.

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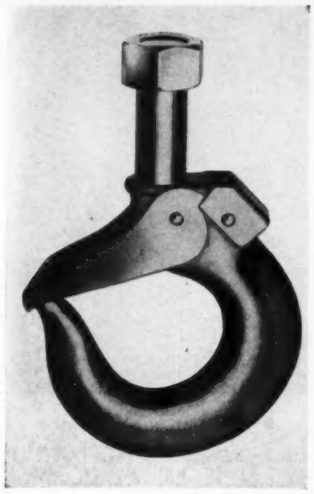


The new Coffing safety hook.

Simple Safety Hook For Lifting Hoists

■ A safety hook developed by Coffing Hoist Co., 800 Water St., Danville, Ill., is reported to be simple enough so that hoist operators will make full use of its safety locking feature during lifting operations. This new safety hook, optional on new Coffing hoists, can be placed on those now in service.

Once the hook is engaged, a stamped-steel latch swings down and is securely held in place by a lock that is under spring tension. There can be no movement of the latch sideways because it fits snugly over the point of the hook. Slight pressure on the release unlocks the latch, and spring tension on the release holds the latch open.

The hook itself is made of drop-forged heat-treated alloy steel. Cadmium plating prevents rusting or corrosion.

For further information write to the company, or use the Request Card that is bound in at page 18. Circle No. 703.

Rubber Lining Protects Against Abrasive Wear

■ Bonded rubber linings are being used to resist the effects of corrosion and abrasion on steel tanks, tubes, and other machinery components subjected to hard use. The lining may be applied to all shapes and sizes of tanks, castings, and welded equipment, and to construction machinery such as mixing units. It is said not to slough off and will not crack or buckle under alternate drying and wetting.

The Goodyear Tire & Rubber Co., Akron 16, Ohio, reports that such linings have been applied by hydraulic engineers to steel pipes used in clearing the river bottom in channels and shipping lanes of the Mississippi River. The unprotected pipes were being disintegrated by the sharp particles of sand, rocks, and debris, and were wearing through in a short time. After rubber linings had been installed, more than 30 million cubic yards of material was sucked from the river bottom without serious pipe failure.

For further information write to the company, or use the Request Card that is bound in at page 18. Circle No. 689.

Machine Rides Road Forms To Spray Curing Compound

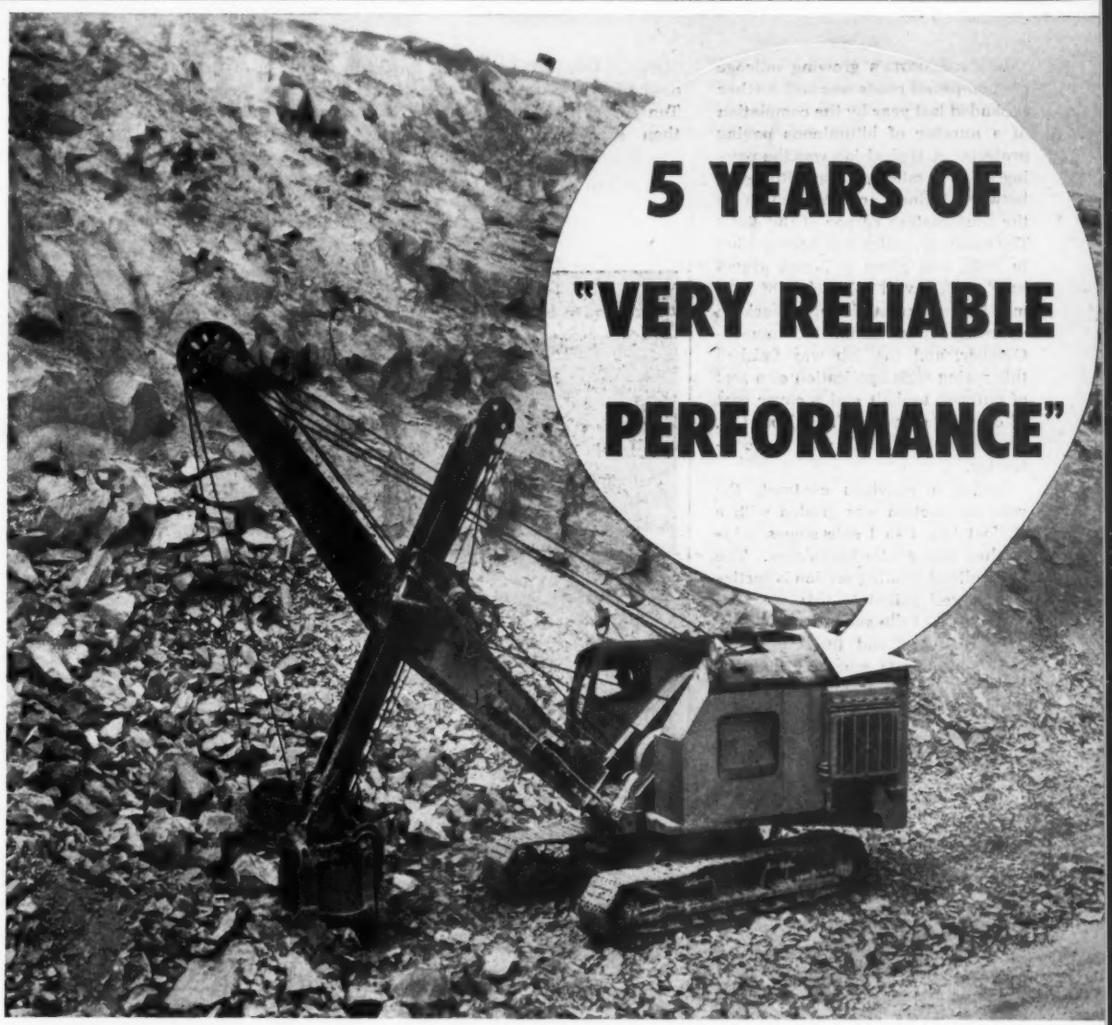
■ A self-propelled automatic machine that rides on highway forms to spray curing compound on the concrete slab is shown in literature from the Flexible Road Joint Machine Co., Warren, Ohio. The Flex-Plane concrete curing machine has a single nozzle that rides transversely on a track to give a regular double-spraying pattern. It applies all types of curing compounds, keeping them at the right consistency by means of a by-pass system that constantly agitates the material.

According to the manufacturer, the machine can be adjusted to a preset speed and will then operate unattended, trailing the paving operation at just the right interval. Because it is the last machine on the forms, it is in a natural position to do the belting and brooming operations where required, and special attachments are provided to do these jobs.

Components illustrated in the literature include a direct pressure pump that delivers from 0.25 to 2.2 gpm, and the telescopic frames, shafts, and spray track that make the machine adjustable from 20 to 25 feet and from 10 to 15 feet in width. The booklet also shows two portable hand-operated spray rigs for areas inaccessible to the self-propelled machine.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 798.

Need information on equipment? See card at page 18.



THIS Northwest 1½-yard shovel has worked steadily since 1949 for Duffy Reed Construction Co., of Twin Falls, Idaho. Speaking of the CAT* D13000 Engine that powers the shovel, W. L. Reed, secretary of the company, says: "In spite of mile-high altitude and dry and dusty conditions, it has given us very reliable performance on various road construction jobs."

The shovel is shown here excavating blasted rock for the relocation and grading of five miles of U. S. 93, 45 miles south of Twin Falls.

Other Caterpillar equipment owned by the firm includes a D318 Engine, powering a Koehring ¾-yard shovel, a D17000 Engine, six D8 Diesel Tractors, a D6 and three No. 12 Motor Graders.

Standardizing on Caterpillar-powered equipment pays off, as many contractors can testify. Operators know and trust these familiar, dependable engines. Parts are interchangeable. Simplified maintenance and prompt service from a single dealer source help keep the units running steadily, with a minimum of down time. And they're built to operate economically on non-premium fuel.

Leading manufacturers of excavating machinery, compressors and other equipment can supply Cat Engines in the products they build. For repowering old machines, see your Caterpillar Dealer. He has the right power for your job—12 engine sizes up to 500 HP. Call him today.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

CATERPILLAR*

*Both Cat and Caterpillar are registered trademarks—®

SPECIFY CAT POWER FOR HIGH-PROFIT PERFORMANCE

Bituminous Pavement Is Laid Over Gravel

A Cedarapids 8734 crushing and screening plant produces aggregate for part of the base course on a 15-mile North Dakota highway project. The primary unit has a 10 x 36 jaw crusher, and the secondary unit has 24 x 40 rolls. Two Caterpillar diesel engines power the plant. *C&E Staff Photos*

NORTH DAKOTA'S growing mileage of good paved roads was still further expanded last year by the completion of a number of bituminous paving projects. A typical job was the paving of 15½ miles of State Route 13 between Milnor and Wyndmere in the southeastern corner of the state. The roadway, which had been graded in 1951, was given a 7-inch gravel base topped with 2½ inches of hot-mix bituminous surfacing. Blacktop operations were completed in mid-October, and the job was finished this spring with application of a seal of cutback asphalt and a cover coat of crushed gravel. W. H. Noel Co., Jamestown, N. Dak., was the contractor.

Under a previous contract, the roadway section was graded with a 32-foot top, 4 to 1 side slopes, wide ditches, and gentle backslopes. The streamlined grading section is particularly well suited to this area because most of the snow blows off the high roadway, and there must be plenty of storage space for it in the ditches. The flat slopes and wide ditches make it relatively easy and not too hazardous to drive a car off the road into the ditch in an emergency.

On this grade, Noel first placed a 5-inch lift of pit-run gravel and then a 2-inch lift of clay-stabilized gravel over the full width of the roadway. On this base a 2½-inch mat of bituminous surfacing was laid 22 feet wide for the finished surface. A foot-wide wedge of bituminous surfacing on each side of the mat slopes out to the shoulder. Shoulders were given a surface treatment of cutback asphalt.

Gravel Base

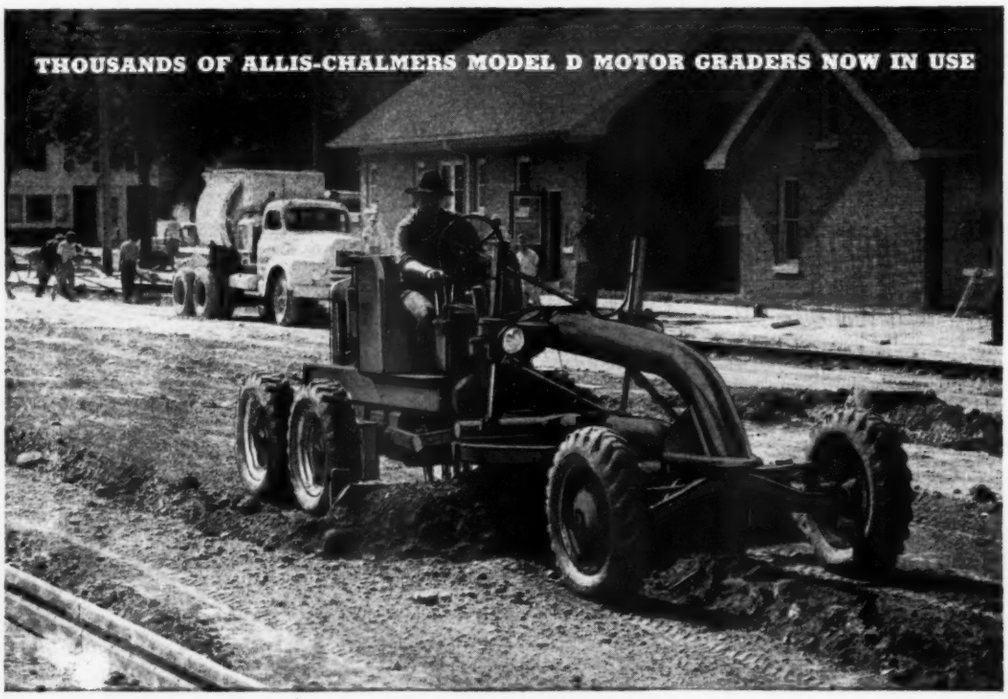
Pit-run gravel for the first base course was produced in a nearby pit. Two Caterpillar D8 tractor-dozers fed the material to a trap which led to a 30-inch conveyor belt. The conveyor dumped the gravel into an improvised plant, where a Diamond screen held the material larger than 2½ inches. Everything passing the 2½-inch screen was hauled to the road for base. This material was dumped on the roadbed and spread by three Caterpillar No. 12 motor graders.

Water was supplied by three 3,400-gallon semitrailer tankers with spraybars. Three pneumatic-tire rollers compacted the base—two Bros 9-wheel rollers and a Bros 13-wheel. International M wheel tractors pulled the rollers.

Gravel for the second lift of the base course was crushed to 1-inch maximum size by a two-stage Cedarapids crushing and screening plant. This material was spread on the roadbed by the motor graders. Ten per cent of clay binder soil was then spread uniformly over the gravel, using a shop-built spreader box mounted on four rubber-tired wheels. Trucks pulled the spreader along, dumping the clay on the spread gravel as they went. A calibrated gate on the spreader applied the proper amount of clay.

After careful mixing and blend-

Finishing between forms on road and street construction is a natural for the compact Model D and its precision hydraulic control, excellent operator visibility.



Five Years in the Field Prove Big-Grader Performance . . . at One-Third the Cost

From its introduction in 1949, the Allis-Chalmers Model D established itself as a real pacemaker in the motor grader field. It was the first low-cost machine to offer such big-grader design and performance advantages as tandem drive, single member tubular frame and the famous ROLL-AWAY moldboard. To its thousands of satisfied owners, the Model D has proved again and again that it does outstanding work on both construction and maintenance.

The usefulness of this amazing machine goes far beyond basic blade functions, with several easily mounted attachments that make it invaluable all year 'round: hydraulically controlled, rear-end loader; shoulder maintainer that is interchangeable with loader bucket; "midship-mounted" hydraulically controlled scarifier; both blade and V-type snowplows.

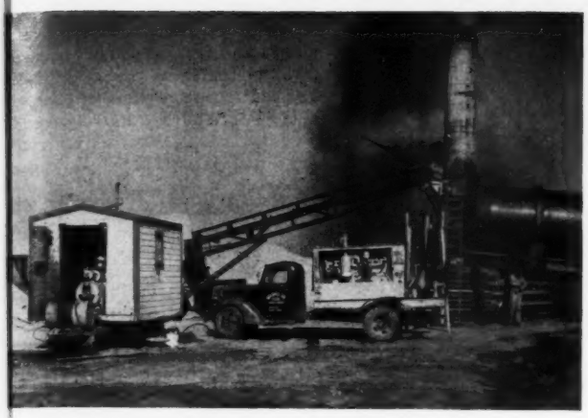
ROLL-AWAY and POWER-CRATER are Allis-Chalmers trademarks.

To help cost and profit-conscious contractors improve their competitive positions, Allis-Chalmers has added even more to the Model D's workability. It now offers a new 50 brake horsepower, "POWER-CRATER" engine; leaning front wheels* and power circle turn*. Yet the Model D's original cost is still only one-third that of a large grader, and operating, service and replacement part costs are proportionately low.

We invite you to talk with your nearby Allis-Chalmers dealer . . . compare values . . . and then ask for a demonstration. Only by watching the Model D at work can you believe that a grader costing so little will do so much . . . *for you.*

*Optional Equipment

ALLIS-CHALMERS
TRACTOR DIVISION • MILWAUKEE 1, U. S. A.



Side view of the composite hot-mix plant. The Caterpillar D13000 engine on the truck drives the dryer and gradation unit through a belt.

A Barber-Greene finishing machine lays a 2½-inch course of asphaltic concrete. Trucks with 5-yard dump bodies deliver the mix to the machine.

ing of the gravel and clay by three motor graders, the mixture was watered to optimum moisture content and compacted by the same rubber-tire rollers used on the first base course. A prime of 0.3 gallon per square yard of cutback asphalt MC-1 was applied to the compacted base by a 1,250-gallon Rosco distributor on an F7 Ford truck. A sand blotter coat absorbed the excess oil, permitting traffic to continue using the road. As no detour was provided, it was necessary to carry traffic through the job at all stages of the work.

Hot-Mix Surfacing

Littleford power brooms pulled by International M tractors swept the excess sand and other dirt from the base immediately ahead of the surfacing operation. A Barber-Greene 879A finishing machine laid the 2½ inches of bituminous surfacing on one-half of the roadway in a single pass. A second finishing machine, following closely, placed approaches and intersections. Three rollers worked with the pavers compacting the mix. Two were Huber tandems, and the third was an Ingram 10 to 12-ton three-wheel roller.

Bituminous surfacing was mixed in a paving plant set up about four miles east of Milnor. Although the plant was an unusual combination of units made by several different manufacturers, it turned out a good mix at a rate of 160 tons per hour. Working 11-hour days and six days a week under ideal weather conditions, Noel completed the paving in less than three weeks.

The paving plant consisted of a Madsen dryer, a Cedarapids gradation unit, and a Barber-Greene mixing unit. A Caterpillar D8 tractor and dozer fed aggregate from a stockpile to a trap. From the trap, a 24-inch Pioneer belt conveyor 60 feet long fed the material to the 84-inch x 28-foot Madsen dryer. To fill a deficiency in material passing the No. 28 screen, a fine sand filler was added to the aggregate. A Pioneer conveyor powered by a 10-hp electric motor fed the fines from a stockpile to the cold-material conveyor.

Dried material flowed out of the dryer to the hot elevator of the Cedarapids gradation unit, which separated the materials on the ¼-inch screen. In this operation, 100 per cent of the aggregate passed the ¾-inch screen and about 78 per cent passed the ¼-inch. Screened materials were fed to the hot elevator of the mixing unit. The Barber-Greene 848 mixer combined the aggregates with about 6½ per cent of 150-200-penetration asphalt in its continuous pugmill. A hopper on the mixer permitted continuous operation without waiting for trucks. To deliver the mix to the paver, Noel's fleet of 12 Ford F6 trucks with 5-yard dump boxes was augmented by hired trucks. Each truckload was weighed on a Thurman 25-ton truck scale.

A Caterpillar D13000 diesel engine operated the dryer and gradation

Cleans up, loads trucks with hydraulically operated rear-end loader . . . handles sand, gravel, dirt, any material with ⅝-yd bucket.

Close-quarter work is a snap. The Model D's power, traction and maneuverability let it handle landscaping, working between houses, and driveway construction, as well as rough grading.

Backfills fast, economically on trench or ditching projects. Can be kept busy on several jobs, travels from site to site at over 25 mph.

LETTERS from contractors—

Sirs:

We purchased our first Model D in July, 1952. We are called on to do almost every kind of job known to the industry from paving small private driveways and parking areas to the larger street and road jobs. We also do a lot of paving inside buildings such as garages and warehouses. We find the Model D will deliver the goods in close places and on small jobs with a minimum amount of hand labor which is the difference between profit and loss on most small jobs.

The maneuverability, operator's vision, and mobility of the Model D make it a money-maker on any job, large or small. We find the Model D ideal for curb and gutter excavation, cutting sub grades, working intersections, laying down cold-mix materials, spreading base materials and finishing.

We purchased our second Model D in June, 1953, because our first machine had proved to be such a good investment. The Model D's do seventy percent of all our grader work, at our initial investment of about one-third that of the large machine. Our operating costs, fuel and repairs on the Model D's are less than one-third that of the large machine.

HUGH HANLEY
Norris-Hanley-Norris
General Contractors

Sirs:

On May 16, 1952, I took delivery on my Model D and in my opinion there is not a better machine built for small grading work. For spreading rock and dressing up shoulders, it is a dandy . . . you get up on the shoulder and dress it up without any break, and when you get through your work is done. No going back to repair rough places made by a heavier machine.

This grader hasn't been in the shop since it was purchased. I can grease it all over in five minutes. I belive it has made many times what it cost me.

L. E. BUHLER
L. F. Buhler Construction Co.

Sirs:

We are very pleased with our Allis-Chalmers Model D Motor Grader. This machine is being used to rough grade and finish grade streets and lots on our 75 acre development. Our area is exceptionally rocky, but we feel we have done big grader work with this machine. We believe this is the toughest machine for its size we have seen.

The "D" is outstanding in its ease of operation. Our operator says he has excellent visibility at all times. It is economical to operate and has worked very satisfactorily.

I. J. MAY, *President*
Southwest Development Co.

units. Auxiliary electrical power for motors and controls was supplied by a Cat D4600 diesel generator set. Steam was provided by a James Leffel & Co. oil-fired boiler burning No. 5 fuel oil. At one edge of the plant site, a sump hole was dug to below ground-water level. A Jaeger pump installed in the sump pumped water to a 1,000-gallon storage and settling tank, from which the boiler feed water was drawn.

Asphalt cement was received in tank cars from the Ohio Oil Co. refinery at Lovell, Wyo. At the siding track in Milnor, a Bros tank-car heater and a Cleaver-Brooks booster heated the asphalt and transferred it to two 4,000-gallon tankers pulled by an International 190 and a WC-22 White truck. These trucks supplied the 5,000-gallon steam-heater storage tank at the plant.

Aggregate for the hot-mix was produced by a Diamond crushing and screening plant having a 10 x 36 primary jaw crusher and 22 x 30 secondary roll crusher. Gravel was crushed to ¾-inch maximum size, resulting in about 15 per cent crushed material.

Seal Coat Delayed

Normally the seal coat would be applied shortly after completion of the surfacing, but due to the cold and uncertain weather, sealing was delayed until spring. However, the shoulders were given a surface treatment of 0.25 gallon per square yard of MC-1 last fall.

With the arrival of spring, the pavement was swept clear and given a seal coat of 0.25 gallon per square yard of cutback asphalt RC-3. Crushed gravel cover coat graded from ⅝ inch to No. 10 was spread over the fresh asphalt at the rate of 140 tons per mile. Seal and cover coats were applied over the shoulders as well as the pavement. Cover aggregate was produced by a Cedarapids crushing and screening plant in a pit about nine miles from the job. This plant, with 10 x 36 jaw crusher and 24 x 40 rolls, produced the 2,335 tons of cover gravel late last fall. The material was stockpiled over the winter and loaded with a front-end loader this spring.

The following quantities of materials were required for the 15½ miles of paving:

Pit-run gravel	93,645 tons
Stabilized crushed gravel	32,655 tons
Hot-mix aggregate	26,684 tons
MC-1 (prime)	96,901 gals.
RC-3 (seal)	69,546 gals.
Asphalt cement	426,944 gals.
Sand for blotter	1,576 tons
Crushed-gravel cover coat	2,335 tons

Personnel

General superintendent of the project for W. H. Noel Co. was A. L. Jensen. He was assisted by Ervin Homuth, road foreman, and Albert Nelson, plant foreman. During construction of the base courses, as many as 120 men working two shifts were employed on the project. Blacktop operations employed about 45 men.

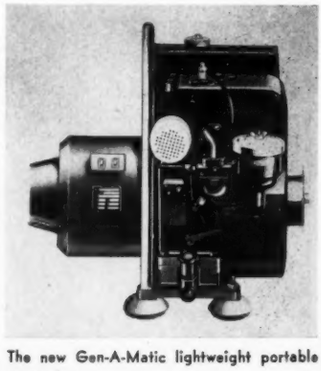
This project was supervised by the Valley City Division of the North Dakota State Highway Department. D. E. Smith is division engineer. Project engineer was Donald Van Vleet. F. H. Brasie is construction engineer of the department. THE END.

Portable Generator

■ A lightweight portable generator that puts out 1.7 kw of power continuously is being introduced by Multi-Matic Corp., 14741 Bessemer St., Van Nuys, Calif., maker of the Super Hole-A-Matic line of earth-boring machines. The air-cooled four-cycle unit features a special Magnematic ignition system for easy starting and has moistureproof construction. Weighing 109 pounds, the Gen-A-Matic generator fits into a small pickup truck.

The generator operates on 115 volts dc and has a heavy-duty brush mounting that gives low current density and long service life. A hard-drawn copper commutator has V-ring construction, and the mica insulation is carefully undercut to increase brush life.

For further information write to the company, or use the Request Card at page 18. Circle No. 743.



The new Gen-A-Matic lightweight portable generator.

O'HADI PATCHER for year 'round patching

The O'Hadi Patcher heats both hole and mix at the same time.
Heats the hole with contained radiant heat . . . NOT a direct flame.
An all weather Patcher.
FAST — ECONOMICAL — PERMANENT
Satisfaction guaranteed.
Sold on 30 days' trial.
Write for full information.

BUHL MACHINE WKS., Buhl, Idaho

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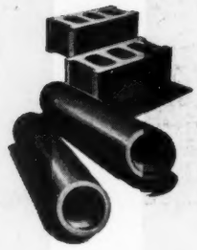
concrete block manufacturers

Basalt Rock Co., Inc., Napa, California, engages in a wide range of industrial operations . . . all requiring the use of heavy power equipment. Both heavy-duty gasoline and diesel engines are operated by Basalt . . . and Shell Rotella Oil is used exclusively as the crankcase lubricant.

Basalt is just one of the many operators of heavy equipment who are getting superior lubrication and reducing costs with Shell Rotella Oil. Here are several reasons why Basalt depends on this one lubricant:

Shell Rotella Oil fights one of the chief causes of engine parts wear. It eliminates cylinder and bearing pitting caused by acid residue from incomplete combustion and low jacket temperatures.

Shell Rotella Oil gives greater over-all economy. Engine parts stay clean and operate efficiently for longer periods. Extending time between overhauls means worth-while savings in labor and parts.

If you operate heavy-duty engines, gasoline or diesel, let us show you the many benefits of using Shell Rotella Oil. *For latest information write to:*

SHELL OIL COMPANY

50 WEST 50TH STREET, NEW YORK 20, NEW YORK
100 BUSH STREET, SAN FRANCISCO 6, CALIFORNIA

Newest of the Whiteman troweling machines is the Model M with a blade diameter of 29⅞ inches.

Farm Work for Contractors

■ Farm contracting is a growing field that offers increasing opportunities for owners of construction equipment, according to new literature from the Caterpillar Tractor Co., Peoria 8, Ill. The booklet gives details on profitable farm work done with Caterpillar-built equipment.

Altogether, 38 different jobs are listed. Twenty-four of these are illustrated by on-the-job photos of owners using their machines to earn extra dividends.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 692.

now...you can RENT

The Neo-Flasher BARRICADE

FOR NO MORE THAN THE OPERATING COST OF ONE KEROSENE TORCH

NO MESSY KEROSENE • NO BARRICADES TO BUILD • NO STORAGE PROBLEMS • NO WEEKEND PREMIUM LABOR • NO CAPITAL INVESTMENT

Neo-Flasher Steel Barricade Model A Equipped with reflectorized steel panel, Neo-Flasher Model 1-100-LSR, tamper proof switch and locking device. Your name plate at slight extra charge.

DEALER INQUIRIES INVITED

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407-c COMMERCIAL CENTER ST. • BEVERLY HILLS, CALIF.

Troweling Machine Has Small-Diameter Blade

■ A small-size trowel-type finishing machine is announced by the Whiteman Mfg. Co., 3249 Casitas Ave., Los Angeles 39, Calif. The Model M finishing machine weighs 91 pounds and has a 29⅞-inch trowel diameter so that it may be carried through ordinary door openings. Powered by a 1½-hp Continental AU 7 engine, it can be operated at extremely slow speeds for best floating and at the higher speeds necessary for various types of finishing.

The machine utilizes 6 x 13-inch single trowels for both floating and finishing, eliminating the necessity of changing trowels for these two operations. An improved type of rigid trowel arm prevents misalignment resulting from wear of the arm in the base.

According to the manufacturer, the machine's light weight permits it to be placed on the slab much earlier than is usually possible.

For further information write to the company, or use the Request Card at page 18. Circle No. 803.

Clark Forms Leasing Firm

The formation of a new subsidiary to finance leasing of its equipment on a national basis has been announced by Clark Equipment Co., Battle Creek, Mich., manufacturer of material-handling trucks and bulk-handling equipment. The new firm is known as Clark Leasing Corp.

Under terms of the Clark lease plan, equipment is leased to the customer for a 3 or 5-year period. The simple interest rate paid by the customer for the leasing privilege is 3.79 per cent of the cost of the equipment. Clark's franchised dealer will work with the customer-lessee to work out the necessary details. Clark Leasing Corp. will be the owner and lessor of the equipment and provide all necessary financing.

The program is not intended to promote the leasing of equipment in preference to outright purchase, according to Clark officials, but is in response to the need, on the part of a sizable segment of the industrial community, for a low-cost leasing plan which will eliminate the need for capital investment.

In a recent 6-month test period, Clark Co. leased more than $2 million worth of industrial trucks.

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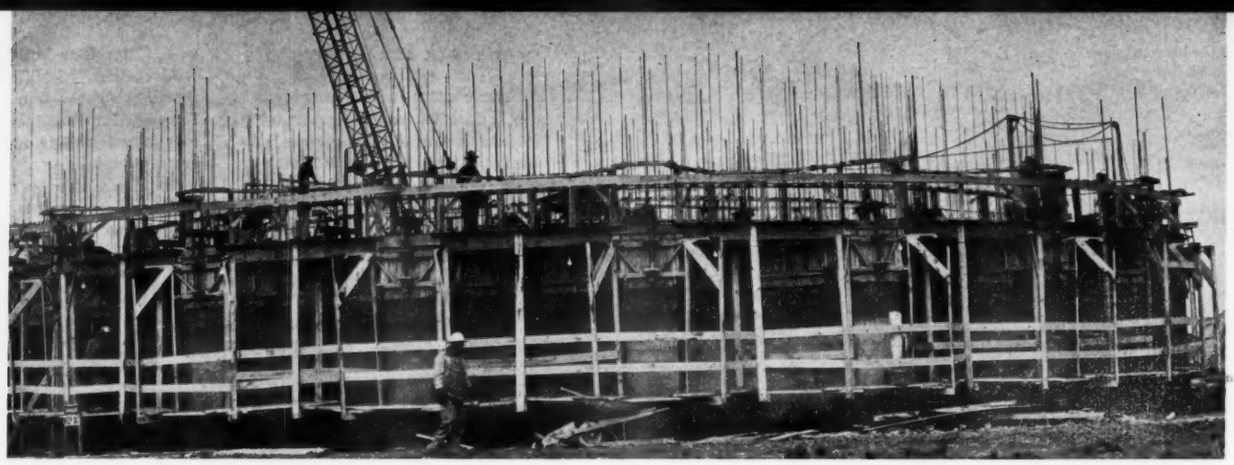
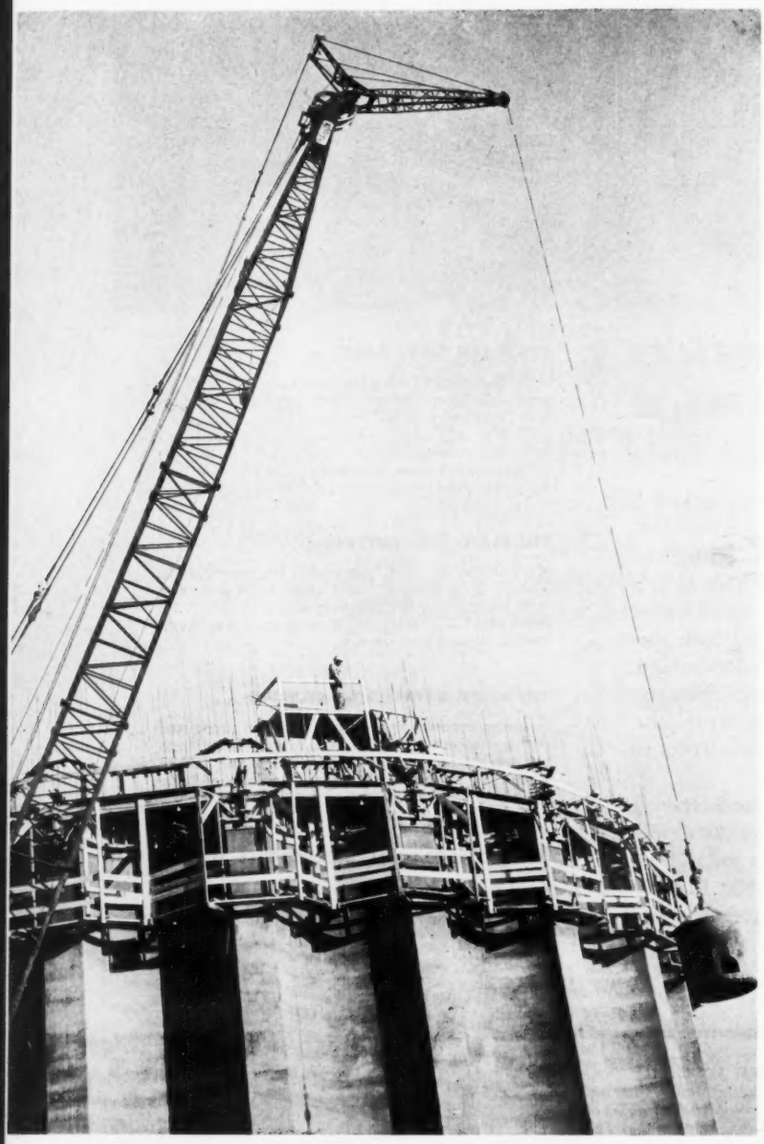


As the slip form rises above the ground, a hanging scaffold is attached to the outer edge of the huge frame. Workmen on this scaffold finish the concrete as the form rises. Steel reinforcing rods project from the pour in each of the four cylinders.

Hydraulic Jacks Lift Slip Form for Tower

Four concrete cylinders poured continuously in building structure to support prestressed water tank

By RALPH MONSON, Field Editor



A Marion crane swings a 1-yard bucket up and over the hopper, delivering concrete for the pour. When the bucket is in position, the workman on the platform pulls a lever which opens the gates and lets the concrete flow into the hopper.

FOUR THIN concentric cylinders of reinforced concrete, rising 83 feet above their footings, form the tower for a new 2,000,000-gallon prestressed-concrete water tank in Dallas, Texas. The tank itself is 100 feet in diameter, and the top of its concrete dome is 125 feet above the gently sloping hill on which the facility stands.

Designed by Preload Construction Corp., New York, N. Y., and built by Whittle Contracting Co., Dallas, for the Dallas Department of Public Works, this unique structure is the result of an interesting six-month construction job. The four cylinders of the tower, including the fluted outer ring, were cast in eight days of continuous pouring by means of a giant slip form operated by Concretor system hydraulic jacks. Preload prestressed the tank and dome.

Whittle's bid of $229,000 was the lowest of those for both steel and concrete tanks submitted in competitive bidding. The tank structure was built to increase the capacity of the municipal water system in a rapidly developing area in the northeast portion of Dallas.

The three inner cylinders which make up the tower have radii of 14.67, 29.33, and 39.58 feet, respectively, and are only 6 inches thick. The outer ring, which is a series of large flutes, varies in thickness from 6 to 9 inches. These cylinders rest on circular concrete footings in the solid rock of the hill. A reinforced slab 2 feet thick caps the cylinders and provides the floor for the tank.

Walls Rest on Rubber

Measuring 100 feet in outside diameter, the tank wall is 35 feet high and 8 inches thick. This wall rests on a rubber pad on the tank floor. As circumferential prestressing is applied to a tank, there is a slight inward movement of the wall on the base which is accomplished by a slight deformation of the rubber pad. In previous tanks of this type, a lubricated sliding joint permitted this movement. A dumbbell-type water-stop, cast into the base and the tank wall, gives positive assurance against leakage at this joint.

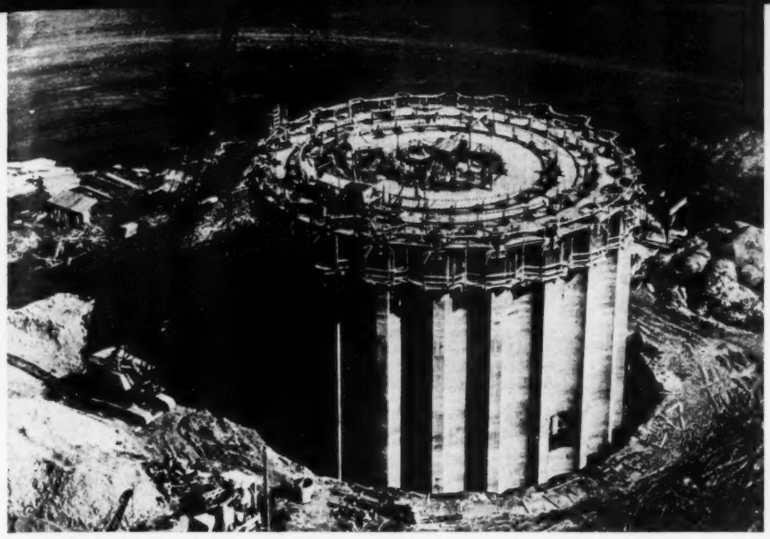
The tank walls were prestressed by winding them with high-tensile wire by the Preload system. After prestressing, the exterior of the tank was coated with about an inch of pneumatic mortar over the wires. The concrete dome is 8 inches thick near the edges and tapers to 4 inches at the center. It spans the 100-foot tank without interior supports.

Trencher Cuts Rock

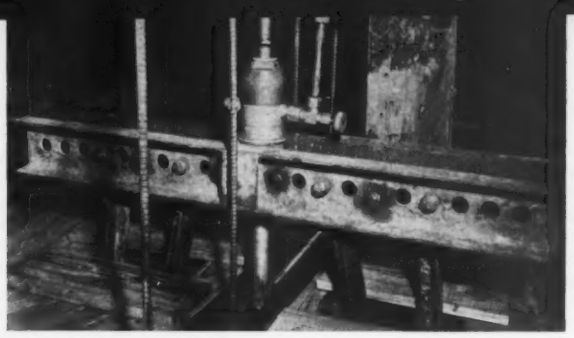
Using a Marion 93-M dragline with 2½-cubic-yard Hendrix bucket, Whittle excavated a circle well in excess of 100 feet in diameter in the underlying rock. Earth and loose rock were excavated by the dragline. As the rock became harder and the dragline teeth were unable to dig into it, a Cleveland 140 trencher cut a series of shallow trenches straight across the excavation in one direction. This provided some loose material for the dragline to pick up and also gave the teeth a chance to dig into the weakened rock ridges between the trenches. An International TD-14 tractor with Bucyrus-Erie dozer helped loosen some of the rock and kept the excavation cleaned up.

After about 4 feet of rock had been removed over the entire circle, trenches 2 feet deep were cut for the footings. Footing for the inside ring was 3 feet 6 inches wide. For the next two rings, the footings were 2

(Continued on page 28)



This aerial view shows the four tower cylinders rising to their full 83-foot height, with the slip-form platform at the top of the structure. Two concrete plants—one a standby unit to insure uninterrupted pouring—were set up nearby.



The Concretor hydraulic jack climbs the jacking rod monkey-fashion, carrying the slip form with it. Jacking rods are drilled and tapped at both ends and are connected with studs.

The slip-form platform becomes the bottom form for pouring the floor slab of the water tank. Here workmen tie the reinforcing for the 2-foot-thick floor slab. The Marion crane which delivers the concrete is at the left.

A steel jack yoke carried on each of the 127 Concretor jacks is attached to the bottom wale of the slip form. Piping connects the jacks to a pair of centrally located electrically driven pumps.

Crews pour the dome for the 2,000,000-gallon tank supported by the tower. Pumpcrete machines deliver concrete to the top of the tank for this pour. A discharge pipe swings around on dollies which ride a track on the dome form.

Preload's wire-winding machine wraps the finished tank with high-tensile wire in the prestressing operation. The machine is suspended at the left of the tank from a carriage which rides the edge of the dome.

(Continued from pages 26 and 27)

feet 6 inches wide, and the footing for the fluted outside ring was 5 feet 6 inches wide. The Cleveland trencher cut a circular trench 22 inches wide for each of the three inner rings and a double circle for the outer ring. Footing excavations were then completed with air hammers. Two Ingersoll-Rand compressors of 315 and 500-cubic-foot capacity provided air for seven paving breakers used to trim the footing trenches.

Use Two Concrete Plants

Concrete for footings was mixed on the site and placed by the Marion crane using a 1-yard Johnson bottom-dump bucket. Two complete concrete batching and mixing plants located on opposite sides of the tower provided insurance against delay or stoppage due to the failure of one plant during the pouring of the tower.

The plant used for the tower pour consisted of a Johnson Lo-Bin, equipped with a Johnson 402 traveling weigh batcher for the aggregates. An Insley crane with a ½-yard Owen clamshell bucket charged the bins and maintained the aggregate stockpiles. Aggregates were delivered to the site by truck from the Dallas Gravel Co. yard. Sack cement was stored in Fruehauf trailers spotted adjacent to the plant, and the cement was added to the skip by hand.

A Koehring 27-E paver, with boom and bucket removed, mixed the concrete at the plant. The mix was discharged directly into a bucket which was hoisted to hoppers by the Marion crane. Georgia buggies were used to place concrete in the form. Two Pumpcrete machines placed concrete in the tank walls and dome. One machine located at the paver pumped the concrete to the tank floor, where the second machine pumped it to the center of the floor. A swivel joint and bend at the center of the floor relayed the pipe to the forms through a pipe mounted on dollies.

Water from the municipal system was piped to the mixer. Since most of the pours were made during January, February, and March—when Dallas temperatures frequently drop into the 30's—it was often necessary to heat the water. Aeroil coil-type kerosene-burning water heaters warmed the water to any desired temperature. It was not necessary to heat the aggregate.

Concrete for the footings and tower, half of the tank floor, half of the tank walls, and half of the dome was produced by the plant described earlier. The second plant, which produced for the remaining pours, contained a Winslow Binanbatch aggregate hopper with traveling weigh hopper and Winslow scale. The same Insley crane charged the hoppers, and cement and water were handled just as they had been at the first plant. A Rex 27-E paver mixed the concrete at this plant. Though the two units were not operated simultaneously, the possibility of a breakdown during the slip form operation made it advisable to have a standby plant at all times.

Hydraulic Slipform Jacks

The four rings of the tower were cast simultaneously in a single large slip form which was raised by Concretor system hydraulic jacks. Steel jack yokes hooked under the bottom wales of the form. Wales were made up of segments of 2 x 6, cut to the proper radius. Vertical 1 x 4 tongue-and-groove sheating 45 inches long made up the form faces. A solid floor was laid over the entire circle with the exception of the spaces for the four rings and a portion of the space within the inner circle. This floor provided a working platform while the tower was being built and then served as a bottom form for the pouring of the tank floor.

Each of the 127 Concretor hydraulic jacks was attached to a pair of

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Insley crane with ½-yard Owen clam-bucket feeds sand and gravel to the n batch plant. Aggregate is dumped into pper of the Koehring 27E paver, and is added by hand. The paver discharges e 1-yard Johnson bucket, which is lifted form by a Marion crane.

jack yokes on the form and to a 1-inch steel jacking rod. A closed system of ½-inch piping connected all of the jacks to a pair of central pumps, which were driven by 2-hp, 220-volt, three-phase electric motors. Valves at the pumps controlled the operation of all of the jacks simultaneously, but individual valves on each jack made it possible to operate them separately if desired.

Jacking rods were supplied in random lengths and were tapped in both ends to permit them to be connected by studs. Attached to the jack was a recovery tube 3½ feet long with an inside diameter of 1⅛ inches. As the jack was raised, this tube followed, leaving a small space around the jack rod. Rods were removed at the completion of the pour with the use of a special recovery tool.

In action the jacks climb the rods monkey-fashion, lifting the form as they go. Each jack contains two sets of jaws which grasp the jacking rod. When the hydraulic pressure comes on, the lower jaws grasp the rod as the jack and the form rise one inch. This action also compresses a spring in the bottom of the jack. When the upper jaws take hold of the rod, the spring raises the lower jaws ready for another step.

One-Man Operation

Hydraulic pressure up to 1,700 psi could be supplied by the two pumps, but the form was usually raised on about half that pressure. One operator at the pumps controlled the entire operation. At the beginning of the lift, all jacks were leveled by operating the valves on the individual jacks. Thereafter, all jacks were checked for level every two feet of lift and were adjusted if necessary.

In order to supply the 220-volt three-phase current required by the pump motors, Whittle set up a 15-kva 220-volt three-phase Master generator driven by a Hercules engine. Two spare hydraulic pumps were kept on hand for use in case of emergency.

Two concrete hoppers were set up on the deck of the slip form to receive the concrete from the buckets and dispense it to buggies. A hopper of 1½-cubic-yard capacity was set up between the two outer rings, and a 1-yard hopper served the two inner rings. The Marion 93-M crane was fitted with a 120-foot boom and a 25-foot jib to enable it to swing the 1-yard Johnson bucket over the hoppers. A workman on a platform beside the hopper tripped the bottom gates of the bucket to dump the concrete into the hopper. A hand-operated gate at the bottom of the hopper discharged the concrete into Georgia buggies which were wheeled to all parts of the circular form.

Reinforcing for the cylinders consisted of ½-inch bars placed horizontally and vertically at 12-inch intervals. Vertical bars were held in place by jigs on the forms. Horizontal bars were stored on the platform and were placed and tied to the vertical bars as the form was raised. Reinforcing bars were placed in the center of each of the rings.

Concrete was carefully hand-puddled to avoid disturbing the previous lift, which was setting up. When temperatures were under 60 degrees, which was the case during most of the pouring, the form was raised at a rate of about 8 inches per hour. Under the most favorable conditions, the rate was a maximum of 12 inches per hour. To permit access to the inside of the tower, doors were blocked out during the pour. Through each of the three outer rings, three doors 12 feet wide and 10.5 feet high were provided. One such opening was left in the inside circle.

Building Tank Walls

Tank walls required casting without horizontal construction joints. Whittle formed and poured the 8-inch walls in two halves, pouring the entire 35 feet of height in one continuous pour. Universal form panels of steel and plywood, measuring 2 x 3 feet, were used to form the tank walls. The inside form was set up the entire height of the wall and braced. The outer form was then built up 12 feet, and the concrete was poured to that height. Forms were added in 3-foot lifts as pouring continued, until the entire half of the tank was poured. Each half required 14 to 16 hours of continuous concrete-placing work.

Vertical prestressing units were built into the wall of the tank as

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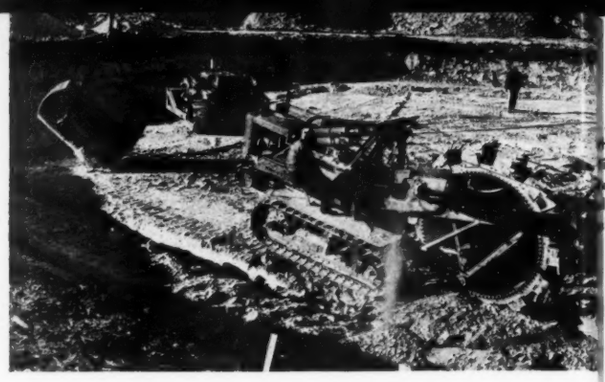
it was placed. These units, placed at 4-foot intervals around the tank, consisted of ⅞-inch Stressteel bars encased in metal sleeves and fitted with 5½ by 4-inch bearing plates at the top and bottom. Before application of the circumferential winding, the units were stressed by jacking to provide vertical prestress which would counteract the effects of vertical bending and temperature stresses. After the stress was applied, the rods were grouted into the sleeves.

The dome, prestressed like the tank walls by Preload, was completely formed and poured in one day. Whittle's men also handled this pour with Pumpcrete machines.

Circumferential Prestressing

After the tank had been cast, it was prestressed within 10 days by winding the walls with 1,360 wraps of high-tensile wire drawn to a diameter of 0.141 inch from the original diameter of 0.162 inch. In this winding, 23,300 pounds of wire were used. Preload also applied a coating of about an inch of pneumatic mortar over the exterior of the tank to assist in bonding the wire and to protect it from the weather.

Preload's wire-winding machine applied the circumferential prestressing at 150,000 psi. The ma-



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A Cleveland trencher, a 93-M Marion crane with Hendrix 2½-yard bucket, and an International tractor with Bucyrus-Erie dozer excavate for the tower footings. The trencher cuts shallow channels which permit the Hendrix bucket to cut into the rock.

chine was suspended down the side of the tank wall from a carriage which rode the outer edge of the dome. The carriage was anchored to the center of the dome by radial wires, and the entire mechanism was self-propelled.

Interior and exterior surfaces of the tank were sandblasted, treated, primed, and painted. Interior surfaces received four coats of phenolic resin paint, while exterior surfaces were given three coats.

Although construction of water mains leading to the tower was under a separate contract, it was necessary to place the riser and base elbow at the time the tower was constructed. The main leading to the tower was constructed of 30-inch prestressed reinforced-concrete pipe. The riser was a 30-inch cast-iron pipe. At the base elbow, where these two lines joined, a block of concrete containing 30 cubic yards encased the pipes and anchored the joint into the underlying rock.

Ground was broken for the project in November, 1953, and although there were several delays due to weather and other causes, the tank was completed in May of this year. In spite of the fact that work on the tower had to be carried on continuously for a number of days, the job was conducted with a relatively small crew. The maximum number of employees at any period was about 35. On the continuous pours, the workmen worked 12-hour shifts so that two crews kept the project in operation around the clock. This cut to a minimum the cost of training the workmen for the specialized work.

Personnel

Superintendent for Whittle Contracting Co. was L. E. Garner. He was assisted by two foremen, C. E. Willis and Theo Willis. Eric Hedeby was technician for B. M. Heede, Inc., New York, N. Y., on the installation and operation of the Concretor slipform system. M. L. Cunningham was job superintendent for Preload. For the Department of Water Works of the City of Dallas, W. S. Hine was construction engineer and Lloyd McKanna was inspector. K. F. Hoefle is superintendent of the department and R. E. Morris, Jr., is chief engineer. THE END

Col. Winegar Is Promoted In Engineer Corps Moves

Changes in district and division administrative personnel have been announced by the U. S. Army Corps of Engineers.

Col. W. L. Winegar, Alaska District Executive Officer for the last year, has assumed the post of Assistant District Engineer at Anchorage, Alaska. He succeeds Col. Carl Y. Farrell, who became Alaska District Engineer upon the appointment of Col. L. H. Foote, formerly head of the district, as North Pacific Division Engineer.

The recent decision to transfer remaining functions of the East Ocean Division of the Corps to the North Atlantic Division offices in New York City has resulted in a number of changes. Col. Morton Solomon, formerly District Engineer of the Northeast District, New York, N. Y., has been named East Ocean Division Engineer at Richmond, Va., to succeed Brig. Gen. Robert G. Lovett, who has retired June 30.

Col. Sultan Cohen, formerly Operations Division Chief of the East Ocean Division, succeeds Col. Solomon as Northeast District Engineer. Col. John H. Anderson, who has been Officer in Charge of the Advance Echelon of the East Ocean Division at St. John's, Newfoundland, has been transferred to Richmond as East Ocean Division Executive Officer. He replaces Col. Carlin H. Whitesell, transferred to the Army War College in Carlisle, Pa.

Replacing Col. Cohen in the Richmond office will be Major James H. Banks, formerly an area engineer in Greenland.

Col. George E. White, Jr., who was graduated last month from the Army War College, Carlisle Barracks, Pa., has taken up his duties as St. Louis District Engineer. He succeeds Col. Fred E. Ressegieu, who has been assigned to the office of the Assistant Chief of Staff, G-4 (Logistics), Department of the Army.

Effective August 2, Col. James U. Moorhead, executive officer of the North Pacific Division at Portland, Oreg., will become Portland District Engineer. Col. Thomas H. Lipscomb, now Portland District Engineer, will be assigned to Troop Operations, Office, Chief of Engineers.

"EUCS" KEEP NORTH CAROLINA JOB WELL AHEAD OF SCHEDULE

Hertford & Cecil are using 7 Euclid Scrapers, five 15.5 cu. yd. and two "Twins" of 18 yd. struck capacity, to move most of the million yds. on a rush project for the Corps of Engineers in North Carolina. The job has a one year deadline but was nearly 50% complete in 90 working days—the productive capacity and versatility of the combination Euclid fleet really made the dirt fly! Material ranged from wet sand to tough hardpan laced with cypress roots and stumps. Hauls average a mile over roads with high rolling resistance—often exceeding 15%. The power and traction of "Euc" Scrapers and their rugged dependability has enabled these contractors to set a fast pace on a difficult job that seemed impossible for large capacity self-powered scrapers.

ANOTHER MISSOURI BASIN DAM BUILT WITH "EUCS"

Excavation for Tiber Dam in Montana will exceed 15 million cu. yds. which must be moved in three working seasons. James-Wunderlich Construction Co. is using a fleet of 25 "Eucs", eight 15.5 cu. yd. scrapers and seventeen 25 cu. yd. bottom-dumps to haul from three borrow pits as far as 2.8 miles from the dam. Five of the scrapers are top loaded by a 5 yd. dragline that excavates impervious fill material from the outlet channel. Average hourly production of each scraper on a 2200 ft. haul is 90 bank yds. of material weighing 3200 lbs. per bank yd. Excellent job availability and minimum downtime of the "Euc" Scrapers is paying off in extra production and lower costs.

The Bottom-Dump fleet is now on its third major dam project since 1947, having worked on Cherry Creek Dam in Colorado prior to moving 6 million yds. at Oahe Dam in South Dakota . . . further proof of Euclid stamina and dependability.

VERSATILITY IS THE WORD FOR THE EUCLID TWIN-POWER SCRAPER

It's four-wheel drive, no-spin differential, and total of 380 or 400 h.p. with Torqmatic converter and transmission provides ample power and traction for self-loading and high speed hauling of heaped loads up to 24 cu. yds. Contractor Bert Altfillich first used his two "Twins" for canal and levee construction on a flood control project at Long Beach, California. He then put them to work on land leveling for a large residential subdivision and is now completing a plant site grading job involving 250,000 cu. yds. of sand.

Owners in other sections of the country, too, are enthusiastic about this Euclid Scraper because of its efficiency and low cost dirt moving performance on road work, dams, airports, stripping and stockpiling operations . . . one of every three is a repeat order.

"EUC" SCRAPERS . . . FASTEST GROWING LINE IN THE FIELD!

"Eucs" cut Down-Time and Maintenance Cost to new lows . . . proved on job after job.

NAMES IN THE NEWS

J. E. Buchanan, president of The Asphalt Institute.

Buchanan Is President Of Asphalt Institute

J. E. Buchanan, former president of the University of Idaho, has assumed his duties as president of The Asphalt Institute, a nonprofit organization designed to further the use of petroleum asphalt by sponsoring engineering activities and research. Mr. Buchanan succeeds Bernard E. Gray.

A licensed engineer in California and Idaho, Mr. Buchanan became president of the University of Idaho following his separation from service in 1946. During World War II, he served as a Lieutenant Colonel in the Asiatic-Pacific theater of operations with the U. S. Army Corps of Engineers. Prior to the war, he was a research eigineer with The Asphalt Institute's Pacific Coast Division. He has also been testing engineer for the Idaho Bureau of Highways and has held a number of posts at the University of Idaho since he was graduated from the school in 1927. He is a member of the American Society of Civil Engineers and the American Society for Engineering Education.

Jean E. Hittle, formerly a member of the engineering staff of the New Mexico State Highway Department, has been named assistant engineer of research by the Institute. He will have an office at the national headquarters in New York City.

Italian University Confers Degree on D. B. Steinman

The honorary degree of Doctor of Civil Engineering was conferred June 30 on David B. Steinman, of New York, N. Y., bridge engineer, by the University of Bologna, in Italy. During the ceremonies, Dr. Steinman presented a paper on "Suspension Bridges — The Aerodynamic Problem and Its Solution".

Financing and construction of a specific suspension bridge are the reasons for Dr. Steinman's current visit to Italy. He is discussing plans with authorities there for the building of the proposed Messina Straits Bridge, connecting Italy and Sicily. The bridge would have the longest main span in the world—5,000 feet.

Wisconsin Appoints Two New District Engineers

Wesley J. Burmeister, formerly assistant district engineer of the Madison District of the State Highway Commission of Wisconsin, will begin his duties this month as District Engineer of District 2, comprising the counties of Kenosha, Racine, Waukesha, Washington, and Ozaukee.

Milwaukee County, formerly a part of District 2, has been given separate status as the Milwaukee Metropolitan District, and Edgar G. Plautz has been named District Engineer of the new district. Formerly the State Commission's engineer of expressways, he will continue to handle expressway matters in his new capacity.

Joseph A. Stransky, retiring as District Engineer of District 2, has been engaged as a consultant by Milwaukee County.

Nickerson Chief Engineer Of New York Public Works

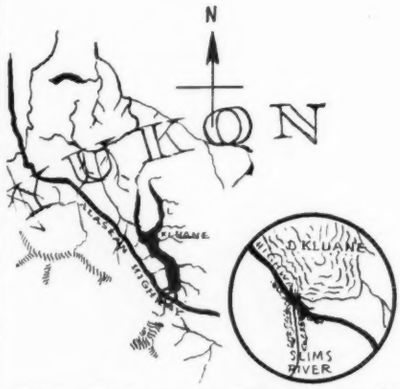
Recent appointments to public works offices in the State of New York include that of George L. Nickerson as chief engineer of the State Department of Public Works, and of Conrad H. Lang as acting chief engineer of the New York Thruway Authority. Both men already have assumed their new duties.

The appointments were occasioned by the resignation this spring of J. Burch McMorran, who had held both positions.

Formerly district engineer in Albany for the public works depart-

EIMCO

EIMCO TRACTOR-EXCAVATORS ON SLIM'S RIVER IN THE YUKON



Along the rocky shore line of Lake Kluane riprap is being loaded into big trucks by an Eimco 105. This is a race against time to beat the spring thaw.

The contract is for building a bridge and approaches to the Slim's River crossing on the Alaskan Highway which runs west from Whitehorse to the southern edge of Lake Kluane then northwest to Alaska.

Working off the frozen surface of the lake in temperatures 30° to 45° below zero the Eimco 105 loads single pieces weighing 6 to 7 tons

ment, Mr. Nickerson has been with the state since 1915.

Mr. Lang has been deputy chief engineer of the Thruway Authority since January of 1952. He has been associated with the State Department of Public Works for many years, having served in the Long Island and Albany offices and as assistant engineer in the Utica district.

Appointed acting district engineer at Albany to succeed Mr. Nickerson was Newton F. Ronan, who has been Albany assistant district engineer since last September. In state public works service since 1911, Mr. Ronan has been district engineer at Utica.

M-C & S Appointment

New vice president in charge of planning and developing new construction projects for Merritt-Chapman & Scott Corp., New York, N. Y., is Ambrose J. Hartnett. He will work in cooperation with representatives of industry, public works, and other government agencies in developing M-C & S planning.

Mr. Hartnett is a former vice president of the French American Banking Corp., and for eight years was associated with Peat, Marwick, Mitchell & Co., New York firm of public accountants. During World War II, he served under the chief of the Naval Bureau of Ordnance, and was discharged in 1946.

Wire Institute Elects

Walter H. Leo has been elected president of the Wire Reinforcement Institute, Inc., Washington, D. C., at the annual meeting held at Boca Raton, Fla. Mr. Leo is sales manager of construction products for Sheffield Steel Corp., Kansas City, Mo.

As president of the trade association, Mr. Leo will head a program designed to broaden the use of welded wire fabric. The institute, sponsoring research activities, is composed of 12 manufacturers.

Michael Baker, Jr., whose work in founding and building the consulting engineering firm of Michael Baker, Jr., won him the Horatio Alger Award.

Horatio Alger Awards To Michael Baker, Jr.

The founder and president of a consulting engineering firm was among recipients of the Horatio Alger Awards presented this spring by the American Schools and Colleges Association. Michael Baker, Jr., head of the Rochester, Pa., firm that bears his name, received the bronze plaque for his "outstanding record of achievement and service".

The awards were presented at a luncheon in the Rainbow Room of the R. C. A. Building in New York City.

Mr. Baker's company is presently engaged in engineering projects in Saudi Arabia and Jordan, where major construction work is under way on hydroelectric dams and irrigation canals. In addition, the firm is working on highway planning and design, underground storage facilities, and numerous building projects throughout this country.

Hedefine Heads ASCE Metropolitan Section

The Metropolitan Section of the American Society of Civil Engineers has elected Alfred Hedefine president for the ensuing year. A partner in Parsons, Brinckerhoff, Hall & Macdonald, New York, N. Y., Mr. Hedefine has held a number of section and national posts in the society.

James H. Griffin, chief engineer of the Transit Authority, has been elected vice president of the section, and Frank C. Mirgain, head of the Department of Civil Engineering at Cooper Union, New York, N. Y., has been re-elected secretary. New society directors are Michael N. Salgo, Samuel D. Stickle, and Joseph S. Ward.

Alfred Hedefine, president of the Metropolitan Section of the ASCE.

he trucks. Many times one rock will be a oad.

e huge pieces are used on the upstream of the fill particularly near the bridge to ct the new fill from damage when the g thaw starts breaking the ice in Slim's and the flow starts toward the lake piling against the fill.

co 105 was selected for the loading job because of its easy operation and maneuverability. The 105 could also load large pieces that would have required much more expensive equipment. In addition the 105 could dig out the rock which usually freezes as soon as it falls to the ground after being blasted.

When your job requires fast, low-cost loading in rock, sand gravel or other material your best selection is the Eimco 105. Write for information.

Big trucks are loaded with chunks weighing 6 to 7 tons. Sometimes one rock is a load.

THE EIMCO CORPORATION

Salt Lake City, Utah—U.S.A. • Export Offices: Eimco Bldg., 52 South St., New York City

New York, N. Y. Chicago, Ill. San Francisco, Calif. El Paso, Texas Birmingham, Ala. Duluth, Minn. Kellogg, Ida. London, Eng. Paris, France Milan, Italy

(Above) Trucks are spotted and quickly loaded by Eimco 105 Tractor-Excavators. No time is lost shifting from forward to reverse or between speed changes on the 105.

(Above) Eimcos are easy to spot to the truck because one track can be run forward while the other is run reverse.

(Below) Large pieces can be loaded from the side or end of the truck. The large granite rock in the bucket weighs between five and six tons.

(Below) Digging in broken rock is easy for the 105. This machine is designed for rock digging and loading.

Shown in operation as a bottom-dump clamshell shovel is the new Drott Four-In-One attachment, mounted on an International TD-6 crawler tractor. It can be converted into a bulldozer, bullclam shovel, front-end loader, or clamshell by a selector lever. ►

Four-In-One Tractor Attachment Changes Usage By Lever Control

■ A new Drott hydraulically controlled attachment for International TD-6 crawler tractors can be immediately converted into a bullclam shovel, a bulldozer, a front-end loader, or a clamshell by a shovel-selector lever controlled by the tractor operator. This lever is located within easy reach of the operator, who can change the Four-In-One attachment while the tractor is in motion or standing still.

As a bullclam shovel, the attachment is used for such jobs as landfill operations and to transport dirt on short hauls. With the clam open, the shovel becomes a bulldozer. Depth of cut is regulated by the forward and backward pitch of the blade, rather than by the lifting and lowering of push-beams as on conventional bulldozers and front-end shovels.

In the front-end loader position, the attachment has the same roll-back at ground level as a standard Drott front-end loader. The bottom-dump feature of the unit gives it a clearance of more than 14 feet above the ground.

For picking up stockpiled or other loose material in confined areas, the operator places the shovel-selector in the clamshell position. During loading and transporting, the bucket may be rolled back and semi-skidded on the ground as in front-end loader operations.

In addition to the four shovel features, the unit may also be used as a backhoe.

The over-all width of the Four-In-One attachments is 68 inches. Height is 40 inches. Shovel capacity is ⅞ yard, and lifting capacity is 3,000 pounds. Breakout force is in excess of 8,500 pounds. Over-all weight of the attachment and the International TD-6 crawler tractor is less than 9,000 pounds.

For further information write to the Drott Mfg. Corp., 3841 W. Wisconsin Ave., Milwaukee 8, Wis., or use the Request Card at page 18. Circle No. 748.

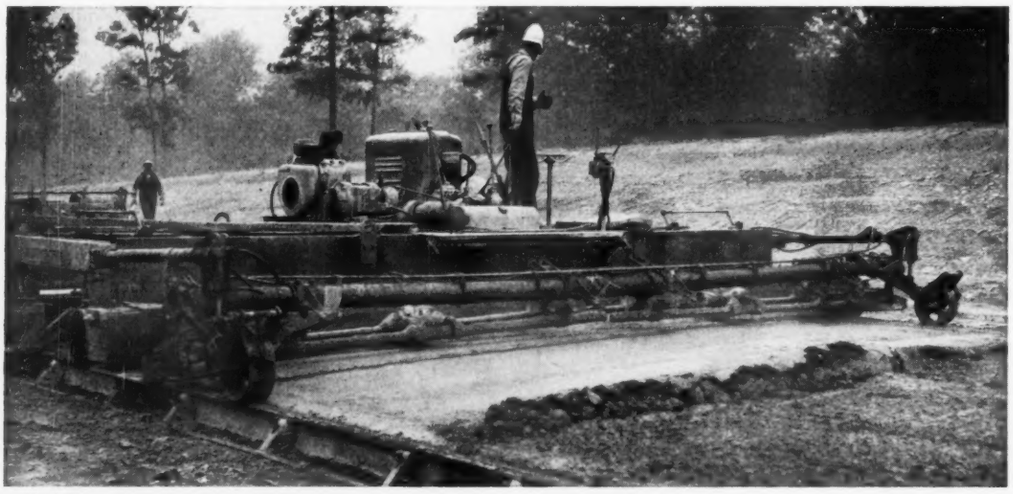
Booklet on Rust Solvent

■ A rust solvent that penetrates tight joints and loosens nuts, bolts, couplings, unions, and other connections is described in literature from Samuel Cabot, Inc., 141 Milk St., Boston 9, Mass. The Tasgon rust-loosening oil dissolves gummed oil, tar, and paint from metal surfaces and cleans and lubricates contact surfaces. It is sold in 3-ounce, pint, quart, and gallon cans, as well as in barrels.

The literature also describes Lubri-Tasgon, a penetrating lubricant for moving parts. A smaller amount of this lubricant keeps grease from congealing and makes motors run smoothly.

Plasgon, a third product made by this company, is used to seal joints, to make gaskets, and as an industrial adhesive. It is said to form a tight permanent joint between surfaces.

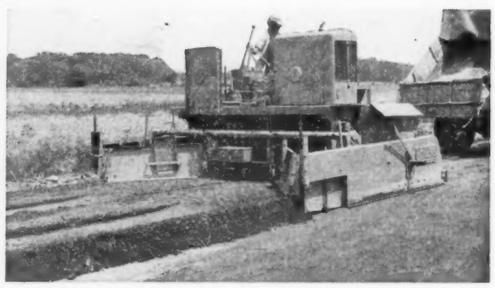
To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 708.



Precision Finishing of Concrete The Jaeger-Lakewood Finisher is the most flexible machine yet developed for placing and finishing concrete slab. In addition to a wide range of independent travel and screeding speeds to meet any condition, Jaeger offers the unique advantage of a diagonally adjustable rear screed for laying pitched slab and super-elevated curves without the usual hand work along the higher form. Vibratory equipment includes exclusive bullnose vibratory screed where deep internal vibration is specified.

How Jaeger methods help low bidders

Screw Spreading of Concrete The screw action of the Jaeger Concrete Spreader remixes and intermixes all paver batches to one uniform texture and higher density, positively eliminating segregation. It also gives your operator closer control of the spreading operation. On high production work the Jaeger Spreader can be furnished with oscillating screed for precision strike-off ahead of the finishing machine. Saves the cost of one or more shovelers, and often, the need for a second finisher where otherwise specified. Vibratory equipment can also be furnished if desired.



Low Cost Spreading of Aggregates In one pass, the Jaeger Paver-Type Aggregate Spreader can lay all the tonnage your trucks can deliver — up to 10″ thickness of coarse stone or as much as 12″ of finer or graded materials in widths to 11′, or place an equal volume of material in lesser thickness up to 12′6″ width. You get that production with a machine that costs half the price of a bituminous paver and does accurate work on highway or airport base, or both base and top for secondary roads. Handles any aggregate, plant-mixed stabilized soil or free-flowing bituminous mix. Two models, to fit any trucks.

For full information on these machines and methods, operating data and prices, talk with your Jaeger distributor or write us. Catalog on request.

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AIR COMPRESSORS • PUMPS • LOADERS • CONCRETE MIXERS • TRUCK MIXERS

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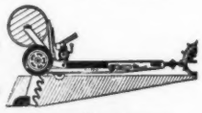
USE Ryan Wire and Cable Layer



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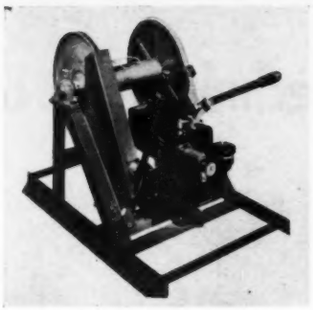

The new Reimann & Georger 500-pound-capacity hoist.

New Power Hoist Has Clutch Feature

■ A 500-pound-capacity power hoist has been developed by Reimann & Georger, 280 R & G Bldg., North Division at Ellicott, Buffalo 3, N. Y. It will hoist loaded wheelbarrows, pallets of brick and cement blocks, and equipment.

This power hoist does not use a conventional clutch or brake. The drive and clutch consist of a heavy-duty V-belt directly connecting the geared gasoline engine with the drum. An idler pulley which tightens the V-belt to raise the load acts as a clutch. The only wearing part is the V-belt, which is of standard size and can be purchased locally. The braking mechanism uses nylon rope around the brake drum.

A 2½-hp four-cycle gasoline engine powers the hoist. Lifting speed is about 100 fpm. The drum comes equipped with 200 feet of steel cable.

For further information write to the company, or use the Request Card at page 18. Circle No. 797.

Manual on Hard-Surfacing

■ A new manual that shows how to rebuild parts and prolong service life with hard-surfacing is offered by the Victor Equipment Co., Alloy Rod & Metal Division, 11440 S. Alameda St., Los Angeles 59, Calif. It gives complete information as to type of alloy to use, preparation, welding, and finishing procedures for hard-surfacing equipment. The loose-leaf manual is divided into several sections covering equipment commonly used in the brick and clay, cement, dredging, earthmoving, and rock-products industries.

Alloy recommendations and welding procedures are based on job-tested usage of latest accepted alloys and methods. A preface describes the complete Victor line of hard-surface alloys for acetylene and manual or automatic arc welding.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 729.

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Lightweight Scaffold Has New Locking Device

■ A scaffolding with a positive locking device for joining the frames is introduced by the American Scaffolding Co., 1815 Woodland, N. E., Warren, Ohio. The Tasco locking device is an integral part of the scaffold frame. It is designed to permit a scaffold section to be folded for storage or carrying.

The scaffold frame is available in either steel or aluminum. A basic section 4 feet high and 5 feet square weighs 96 pounds when constructed of steel, and 40 pounds when made of aluminum. The basic frame sections are 2 feet high and 2, 5, 7, 10, or 20 feet in length.

For further information write to the company, or use the Request Card at page 18. Circle No. 812.

The Tasco scaffold has a built-in locking device which eliminates the danger of accidental unlocking.

Photo example of tough driving condition met by high strength, cold-rolled Monotube piles.

WHY MONOTUBES ARE *Start-to-Finish* PILES

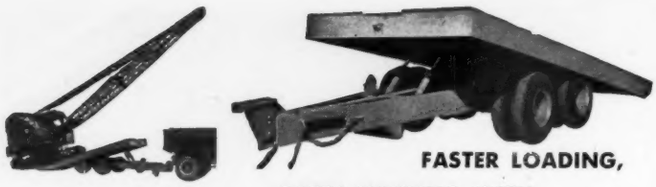
Monotube Foundation Piles

IN construction work, unanticipated soil conditions can often raise cain with costs, work schedules and foundation designs. That's when you really value the unmatched versatility of Monotube piles . . . for any job *started* with Monotubes can be *finished* with Monotubes.

For example . . . you have a choice of gauges, gauge combinations, tapers, diameters or lengths. Other factors bearing on easy job completion with Monotubes are: simplified weld-splicing in the field to almost any required length; cold-rolled construction for exceptional strength; and top-to-bottom visual inspection before concreting.

Why not get *all* the facts on how Monotube piles offer you an unusual margin of assurance, safety *and economy!* Write to The Union Metal Manufacturing Co., Canton 5, Ohio, for Catalog No. 81.

UNION METAL



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MODEL GPX-D — Tandem axle. Drop or flat deck. Cap. 16 through 35 tons.

MODEL PS — Single axle, spring mounted platform or float.

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Reduce loading time . . . increase production time of heavy, slow-moving construction equipment! In a matter of minutes one man can load and secure machinery for job-to-job hauling with a TRANSPORT TRAILER Model XTT tandem axle tilt-trailer . . . capacities 13 through 20 tons. Two double-acting hydraulic cylinders, automatic platform lock give maximum tilt control and load security. Gooseneck type (Model GXTT) also available.

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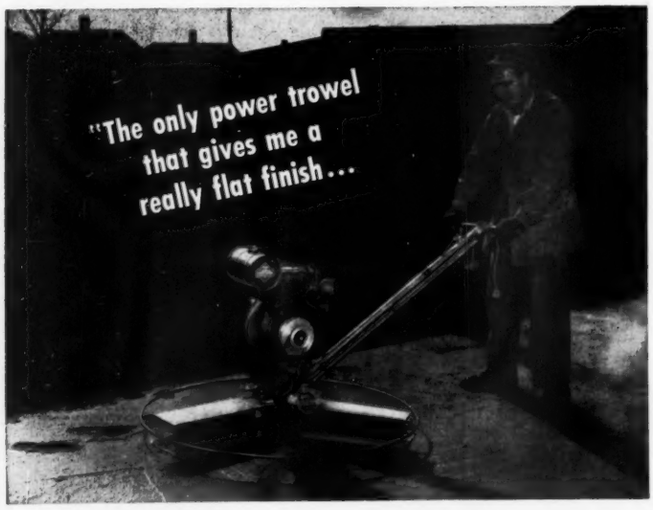

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"Our Master Turn-a-Trowel knocks down every hump on the floor slab."
"I've used others that ride right over the uneven spots."

Contractors can make those statements because the Turn-a-Trowel has rigid—not flexible—blades. Bumps in the floor *have* to come off, so Master-finished floors are flat.

And, because Master blades *adjust* for either floating or finishing, they stay right on the machine. You can't lose or mislay them.

The Master Turn-a-Trowel is a rugged, powerful, top-quality piece of equipment that will help you finish concrete better, quicker and cheaper. For more information mail the coupon below. No obligation.

☐ **Turn-A-Trowel.** Floats and finishes; rigid blade mounting gives precision finish; float and finish blades in single unit, can't get lost; gas and elec.; 34", 48" sizes.

☐ **Concrete Vibrator.** 9,000 rpm vibration, yet lightweight, rugged, gives long service; gas and elec.; wheel mounting available; accessory tools; 1½ to 6 hp power units.

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☐ **Midget Trowel.** New Lightweight, one man carries; gets into tight spots; only 24" across yet does top trowel job 6 times as fast as by hand. 70 lbs.; 1.6 hp engine.

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Bolting Technique Is Usen

Structural frame members are handled by two guy derricks with 100-foot masts and 90-foot booms. As the framework rises, the derricks are jumped two floors at a time, with one rig lifting the other to the new working level. *Ray Day Photo*

NEARING COMPLETION in the heart of Denver's downtown section is a 23-story building constructed without any on-the-job riveting. The project represents the first use on such a big scale of high-tensile bolts. There are some rivets, but they were driven in the fabricating shops. Every field joint made as the structural members were put together was bolted by this easy method.

Field riveting, according to the contractor on this job, is as obsolete as the Model T Ford when compared to the bolted-joint method.

This interesting departure from traditional building practice is a development of Bethlehem Steel Co., Bethlehem, Pa., subcontractor on the $15 million Mile High Center project. George A. Fuller Co. and Webb & Knapp Construction Corp., both of New York, N. Y., hold the contract for development of this futuristic addition to the Rocky Mountain city.

The project is designed to serve a city with a bright future; some observers feel that Denver will be a city of 1,000,000 population by 1970. Patterned after New York's Rockefeller Center, Mile High Center is but one step in the continuing growth of Denver's business district.

The new development will include, besides the skyscraper now nearing completion, a remodeled Sears, Roebuck & Co. building which will house the U. S. National Bank of Denver, a transportation center capable of handling 1,000 automobiles, and various shops and restaurants. The entire project will be united by a distinctive concourse and plaza, landscaped unlike anything ever created in the Rocky Mountain area. The entire job is one of the biggest building projects in the history of Denver.

The new building is scheduled for completion this month. It incorporates many of the most up-to-date features, such as all-year-around air conditioning, automatic elevator service, ample parking facilities, efficient utilization of space, and modern maintenance equipment.

At ground-floor level, the building measures 127 x 152 feet and is composed of a structural-steel framework resting on special reinforced-concrete footings. These extend far beneath street level. The structural framework consists of seven rows of heavy steel H-columns, 6 columns wide, evenly spaced throughout the structure.

The exterior of the building is finished in cast aluminum spandrels. All column covers are of aluminum. Elevator service will be ultramodern, with eight Westinghouse automatic elevators operated by electronic controls. Automatic features of the system have been worked out to coincide with traffic patterns as people enter or leave the building. There

sen Steelwork For Building

Field joints on structural steel beams are fastened with high-tensile bolts in easy installing operation

will be an absolute minimum of delay from elevator time.

Another innovation is the use of a special window-washing car which, when not in use, will rest in a cubicle in a small penthouse atop the building. In use, the washing car will ride outside the walls and will be controlled by the window washing crew.

With the exception of the recently completed Alcoa Building in Pittsburgh, Pa., where reversible window panels permit washing from inside, tall buildings must employ the old and somewhat hazardous method. This special car will bring new safety to the operation.

Interesting Steel Method

Probably the most interesting heavy construction feature of the Denver skyscraper is the fabrication and erection method used in assembling some 4,800 tons of structural steel. The method has caused local bridge engineers, building consultants, and contractors to watch the project with interest.

The use of high-strength steel bolts in assembling structural joints is relatively new to the structural engineering field. It is a method which results directly from the extensive research on fabricated joints conducted in recent years.

Common practice over the years has shown it to be economical to use commercial machine or unfinished bolts in loose-fit holes, but this type of bolt cannot be tightened sufficiently to eliminate the possibility of slipping under working shear loads. As a result, its use is confined to secondary connections where slip is unimportant. Elsewhere, rivets are specified in order to secure a better fit.

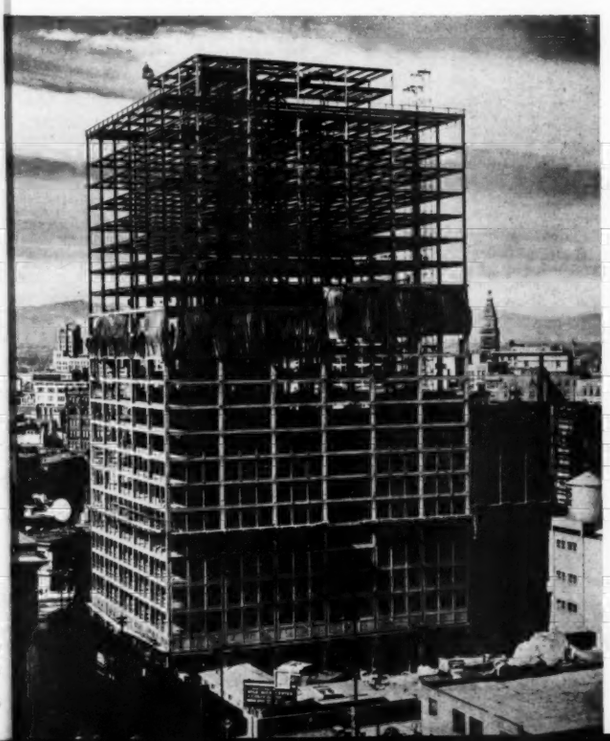
The standard practice has been to use fitting-up bolts to fasten members in place prior to riveting. These bolts are then replaced with rivets. This double operation, with the extra time involved, has been less than satisfactory when labor costs are considered.

In the new procedure, high-strength bolts are used in all the holes. Loose-fit holes are retained for economy in assembling, but the nuts are driven up with power wrenches to provide more clamping force than is obtained with rivets. Slip at working load is therefore not possible, in view of the high friction produced between the jointed members. The bolts are made of carbon steel and are heat-treated for strength. A hardened washer is placed under both the head and nut to permit development of the high torque required, without scoring the connected material.

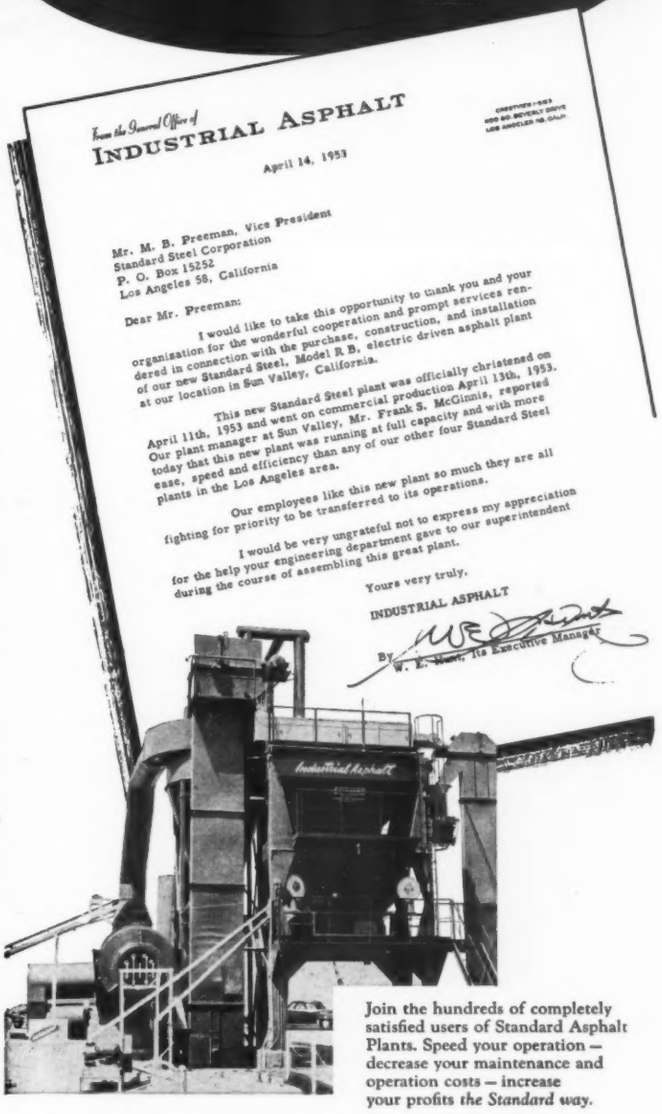
In 1947, the Research Council on Riveted and Bolted Structural Joints was organized for the purpose of sponsoring and promoting research into riveted and bolted joints. The specific object of the council was to determine the strength and action of joints, in order to aid in the development of safer and more economical design where possible.

(Continued on next page)

The 23-story Mile High Center Building erected in Denver is one of the nation's tallest buildings using bolted construction. Bethlehem Steel Co. completed the steel work in 82 working days, using high-tensile bolts to fasten the structural joints.



What more could We say ?


From the General Office of
INDUSTRIAL ASPHALT
April 14, 1953
Mr. M. B. Freeman, Vice President
Standard Steel Corporation
P. O. Box 15252
Los Angeles 58, California
Dear Mr. Freeman:
I would like to take this opportunity to thank you and your organization for the wonderful cooperation and prompt services rendered in connection with the purchase, construction, and installation of our new Standard Steel, Model R.B. electric driven asphalt plant at our location in Sun Valley, California.
This new Standard Steel plant was officially christened on April 11th, 1953 and went on commercial production April 13th, 1953. Our plant manager at Sun Valley, Mr. Frank S. McGinnis, reported today that this new plant was running at full capacity and with more ease, speed and efficiency than any of our other four Standard Steel plants in the Los Angeles area.
Our employees like this new plant so much they are all fighting for priority to be transferred to its operations.
I would be very ungrateful not to express my appreciation for the help your engineering department gave to our superintendent during the course of assembling this great plant.
Yours very truly,
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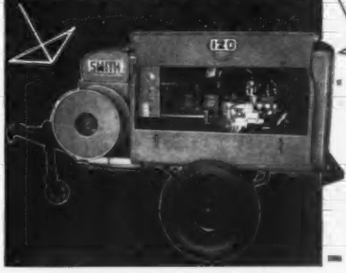

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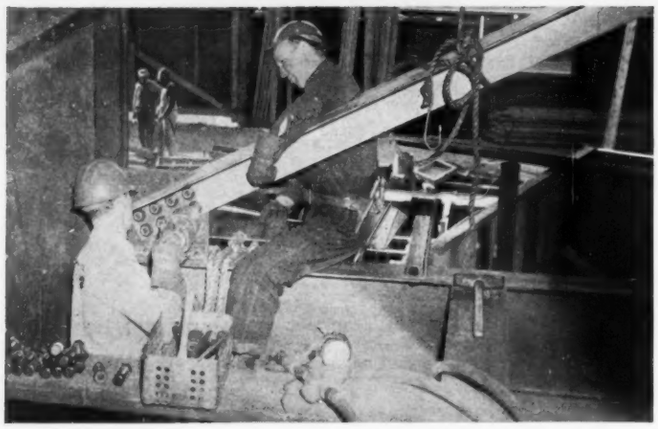

Using a Chicago Pneumatic impact wrench, these workmen join steel members with high-tensile bolts. The bolts vary in diameter from 7/8 inch to 1 1/8 inches. An open-face torque gage is used to determine the tension to which the bolts are tightened. *Ray Day Photo*

(Continued from preceding page)

Results of this investigation indicated that rivets, both hot and cold-driven, do not completely fill the holes in structural members, but provide a certain amount of clamping force between the rivet heads so that the load is transferred from one member to the other by friction. The clamping force produced by hot-driven rivets results principally from the cooling and consequent shrinkage of the rivets, and varies with the grip becoming greater as the grip of the rivet increases. Greater clamping force can be developed by the use of high-strength bolts. In addition, this clamping force is constant for all grips of the bolts.

The investigation showed that the fatigue strength rises with an increase in the clamping force. Thus, the fatigue strength of joints fastened with bolts is considerably greater than that of joints fastened with rivets. Structural plates fastened with rivets will fail on a net section through the first line of rivet holes, but it is not unusual for the plate of a bolted joint to fail through the gross section on a line near the edge of the washers. This indicates that the clamping action of bolts has reduced or eliminated entirely the high concentration of stress around the holes.

Research done by Northwestern University and the University of Illinois between 1949 and 1951 definitely indicated that for structural joints subjected to repeated or reverse loads the bolted joints are superior to anything a rivet can do. Some interesting research has also been done by the Association of American Railroads, which replaced rivets with high-strength bolts in bridge members on several railroads, to determine whether the bolts would retain their clamping force under dynamic load conditions. After four years, it was found that the bolts retained their full clamping force without maintenance. This was in direct contrast to riveted joints, where rivets had to be redriven by maintenance crews, often each year.

Rivets were used in place of bolts in several floor beam hanger connections on railroad bridge trusses in climates where the temperature drops to minus 40. These bolts have been in place for two winters and have proved satisfactory so far.

The use of bolts in the Denver skyscraper marks the first major use of the method in a large building in the Rocky Mountain area. In the past year, however, the bolts have been substituted for rivets in an increasing number of commercial buildings of the multistory type. Bethlehem furnished the first high-strength bolts for commercial structures of this type. The bolts, nuts, and washers conform to ASTM Specification A-325.

According to Simon McEachern, general superintendent of Bethlehem's field crew, the bolted field connections have many advantages from the labor point of view. No longer is it necessary to arrange in each community for skilled riveters. Ordinary ironworkers can be hired, equipped with impact wrenches and the visible open-face gages which are used, and put right to work.

The new technique makes possible the use of considerably more unskilled help than has ever been feasible before in building construction.

Guy Derricks Used

Structural steel members for the building were fabricated by Bethlehem's Western Division in Chicago, and shipped by rail to Denver. The members then were transferred to trucks which hauled to the job site. At the site, the steel was handled by two guy derricks with 100-foot masts and 90-foot booms. These rigs, rated at 25 tons, were driven by Waukesha gasoline engines. One derrick had an American 2-drum hoist and the other, a Thomas 2-drum rig. The hoists were equipped with a General Motors and a Twin Disc torque converter for the smooth fluid application of power.

Two Men Can Easily Handle 14-ft Sections of Sheet Steel Culvert

You don't need special lifting equipment to unload and place long sections of galvanized-sheet-steel culvert pipe.

Take the 18-in.-diameter pipe pictured above. It is 14 ft long and it weighs 214 lbs. Two men can unload and place it in a trench in a few minutes, without equipment.

Large-diameter galvanized-steel pipe weighs only a fraction as much as pipe made of other materials. It comes in longer sections that are easier to ship.

NUMBER OF FIELD JOINTS REDUCED

The longer sections require fewer field joints, a feature that saves costly man-hours. Three 14-ft sections, for example, can be assembled into a 42-ft culvert by means of two field joints.

Bethlehem does not fabricate culvert or drainage pipe, but does manufacture the Beth-Cu-Loy galvanized-corrugated and flat steel stock used by pipe fabricators. This copper-bearing steel more than meets the specifications set by the American Association of State Highway Officials. It carries a 2-oz zinc coating, as determined by the triple spot test. It comes flat or corrugated, in gages from 8 to 16, inclusive; in lengths 60 in. to 156 in.

Any Bethlehem sales office will gladly furnish detailed information on Beth-Cu-Loy, and the names of fabricators who use it. Write or phone.

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BETHLEHEM STEEL

BETH-CU-LOY *GALVANIZED* CULVERT SHEETS

The derricks were jumped two floors at a time—a lift of 22 feet 4 inches. One derrick was jumped in the conventional manner by raising it up by its own bootstraps, so to speak, and the other was raised directly by the derrick on the higher level. Since the building is 312 feet high, this operation involved a considerable number of jumps. In fact, the lifts where one derrick was picked up by the other represented the heaviest single lift on the job. About 6½ tons was involved each time this lift was made.

The high-tensile bolted connections were made by two crews equipped with Chicago Pneumatic impact wrenches and the usual makeup tools for structural joints. A Worthington 315-cfm Blue Brute compressor supplied air through a 3-inch hose, a large receiver, and a reduced 2-inch hose line. "Christmas tree" connections on the end of this hose line farmed the air out to guns as it was needed.

Tightening of nuts is a completely automatic procedure. An air-reduction valve and an open-face gage are employed in the line, and these units are so calibrated that the impact wrench automatically stops tightening when the proper tension is obtained. The ⅞-inch bolts are tightened to 470 pound-feet of torque; 1-inch bolts go to 710 pound-feet, and 1⅛-inch bolts go to 960 pound-feet. The impact wrenches and the open-face gage are set to produce the required tension plus 8 per cent, thus allowing for shrinkage or expansion under varying temperature conditions.

The bolts are very easy to install. One crew goes through a section, places the bolts, and makes the first turns to catch the threads. The remainder of the tightening process is done by the impact-wrench crews.

Every precaution was taken on this job to reduce danger for the steelworkers. For example, timber planking was used to make the floors safe immediately after structural members were in place. Hard hats were a must, of course, and in at least one instance a hard hat saved a life. A structural worker wearing a Bullard spun glass safety hat was hit directly on the head by a falling 7-inch bolt 1⅛ inches in diameter. The blow shoved the hard hat down around his ears, but did not hurt either the man or his hat.

After erection, the steel structural members were fireproofed by concrete. This work was done by the prime contractor, George A. Fuller Co. It was a simple but tedious operation. The forms for this work were of plywood and were carried on 2 x 4 studs and joists. Wire hangers for this operation were made on the job with the help of a small Lewthwaite bender.

Concrete was brought in by truck mixer from a Denver commercial plant. When necessary, it was hoisted by a building tower.

The final design and interior finish of the building is a matter for the future. The various stories will be finished inside to suit the firms which lease the building. Shell Oil Co., for example, has already leased three principal lower floors, and the interior on these floors will be designed to maximum advantage for that company.

Personnel

Known as the 1700 Broadway Building of Mile-High Center, the skyscraper is being constructed under the general supervision of Henry E. Sexton, job superintendent for George A. Fuller Co. He is being assisted by John Layter, job runner, and William N. Hurst, mechanical supervisor. Simon McEachern, veteran structural steel man from the New York area, was in charge of the big steel erection job.

The project was designed by the architectural division of Webb & Knapp, Inc., assisted by Kahn & Jacobs of New York, N. Y., associate architects. Severud, Elstad & Krueger of New York were the structural engineers; and Jaros, Baum & Bolles were consultants.

THE END

Badour Joins Soiltest

Now on the staff of Soiltest, Inc., as manager of the export department, is Alan D. Badour. Before working for Soiltest, Chicago, Ill., manufacturer and distributor of field and laboratory apparatus for engineering tests of soils, concrete, and bituminous materials, he was with the Central Scientific Co.

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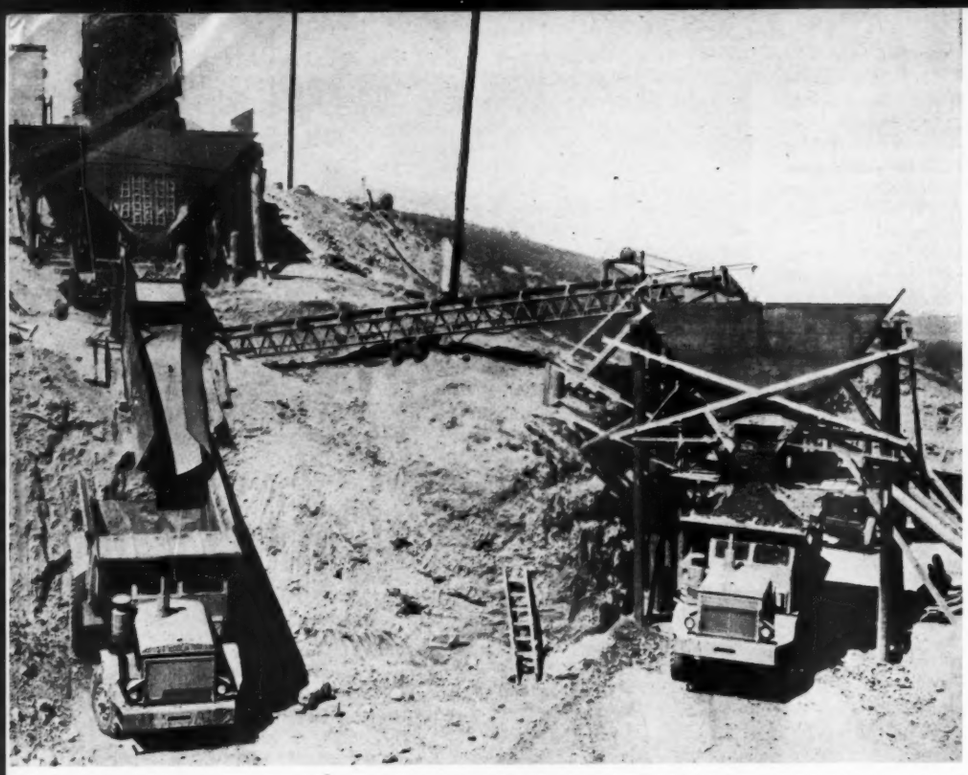


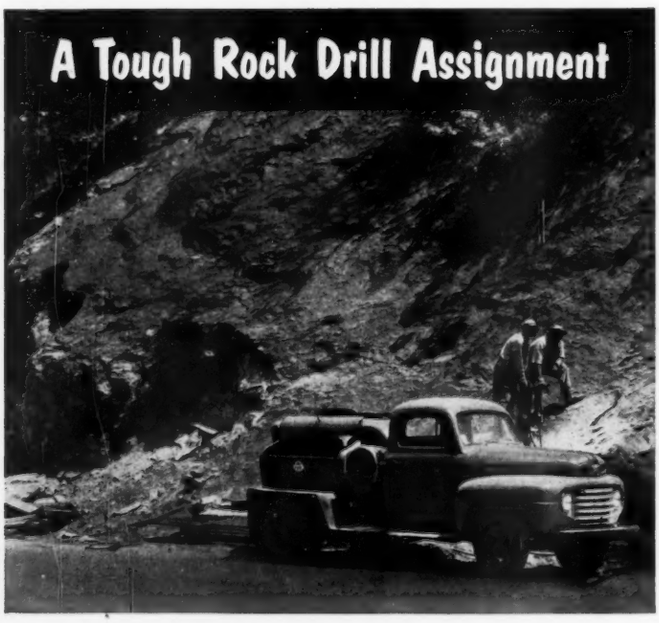
Borrow-pit material used for the impervious core of the dam is fed into the screening plant by an end-dump Euclid, upper left. Screened clay, brought by Universal conveyor to the hopper at right, is discharged into another Euclid. Rock, separated from the material by a Hewitt-Robins grizzly, is chuted to another Euclid, which will stockpile it for riprap.

C&E Staff Photo

Earth-Fill Dam Project Includes Concrete Conduits

DEPENDING ON the season, the James River in the eastern Dakotas has ranged from a series of stagnant pools to a raging torrent. In dry seasons, flow has often not been sufficient to carry away municipal wastes; at peak flows, the river has sometimes threatened to carry away cities along its banks. This was the picture before the spring of this year, when water was first impounded behind the Jamestown Dam.

Beginning with the spring runoff, extremely high and low flows are being averted as impounded water is released under full control throughout the year. While flood control and the irrigation of lands along the James River Valley were the primary reasons for its construction, the dam will also assure cities on the river of a dependable domestic



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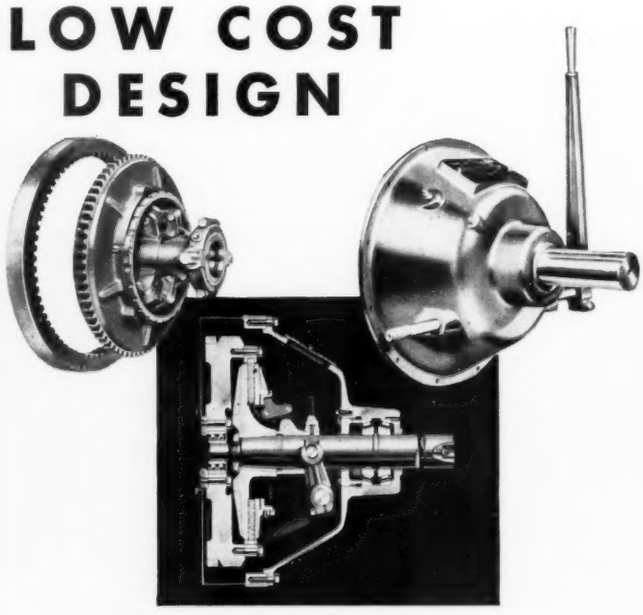

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ROCKFORD CLUTCHES

Screening plant processes 700,000 yards of material for use in the impervious core of the structure

Screened and moistened clay, spread in 10-inch layers by a Euclid scraper and Caterpillar D7 tractor-dozer, is compacted to a 6-inch depth by an Allis-Chalmers HD-20 tractor with double Gebhard tamping rollers. *C&E Staff Photo*

water supply and create a lake which in turn will provide recreational facilities for boating, bathing, and fishing.

Located in Stutsman County, about a quarter mile north of Jamestown, N. Dak., the earth-fill structure has a crest 1,418 feet long. Its maximum height above the lowest foundation is approximately 110 feet. Impounded water will form a lake, about 12 miles long, having a maximum depth of approximately 30 feet and a conservation storage volume of 28,000 acre-feet of water. More than 200,000 acre-feet of flood-storage space is available in the reservoir above the normal lake.

Clearing and preparation of the site began on April 17, 1952, and the structure was completed last fall. Clearing of the reservoir continued into the winter. The general contractor was C. F. Lytle Co., Sioux City, Iowa. Contract price was $1,868,000 exclusive of the reservoir cleanup, which was let as a separate contract.

Glory Hole Overflow

Normal flows of the river, carried through an outlet works, are controlled by two high-pressure slide gates. The inlet structure of the outlet works is located on the left bank at the extreme upstream edge of the dam and is submerged at all normal lake levels. Trash racks in the structure prevent debris from getting to the gate chamber. From the intake, a concrete conduit 9½ feet in diameter and more than 300 feet long leads to the gate chamber under the axis of the dam.

In the gate chamber are two pairs of slide gates: one pair for normal regulation and a duplicate pair for emergency use. The chamber has a hemispherical concrete roof and is completely enclosed within the body of the dam. Below the gates, a horseshoe-shaped tunnel leads to the downstream edge of the dam where the control house is located. Here the water passes through a stilling basin and is discharged into the old riverbed. Gates are operated by remote control from the control house, but a 5 x 7-foot tunnel connects gate chamber and control house to provide access to the gates for inspection and repair.

The overflow, or spillway, works consists of a glory hole inlet structure with uncontrolled crest. From the inlet, 221 feet of concrete conduit 9½ feet in diameter conducts the water through the dam to a stilling basin on the lower side. An unlined channel beginning from the still-

building a nest for giant skybirds with

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Laclede Reinforcing Bars provide a sturdy backbone for the giant new Trans World Airlines hangar taking form at Lambert Municipal Airport, St. Louis. Representing the perfect balance between high strength and maximum anchorage, these multi-rib steel bars are the first choice of more and more contractors throughout America.

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Because of the combined outstanding features, in both construction and performance, Marvel Synclinal Filters bring about the greatest degree of efficiency in all production equipment where filtration of liquids is of the utmost importance.

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Using a job-built hook-rake which does not pick up dirt, a Badger crane clears brush from the old river channel. Buoyant material, which might clog the intake structure, was cleared from the reservoir under separate contract. *C&E Staff Photo*

ing basin leads to the river channel.

Clay Is Screened

Material for the impervious core of the dam was a yellow glacial till obtained from a borrow area on the right bank. About two per cent of the material in the pit consisted of rocks larger than 4 inches, which specifications required be removed before the material was placed in the struceure. When Superintendent B. D. McMillan of C. F. Lytle Co. set to work to devise an economical means of separating the rock, he came up with a plan for a screening plant which worked out successfully.

The plant was set up in a natural ravine near the right abutment, and pit-run material was dumped into a hopper at the upper level. Separated materials flowed into trucks at a lower level. The upper hopper, with a capacity of 35 cubic yards, was fabricated on the job from steel sheets and was supported on timber piling. End-dump Euclids, hauling from the borrow pit, dumped directly into this hopper.

At the bottom of the hopper, a Universal 12 x 42-inch apron feeder with separate electric drive fed the material to a Hewitt-Robins 60 x 144-inch grizzly screen. Rocks larger than 4 inches were retained on the screen and discharged by gravity through a chute into the box of a waiting truck. This material was stockpiled and used for riprap on the upstream face of the dam.

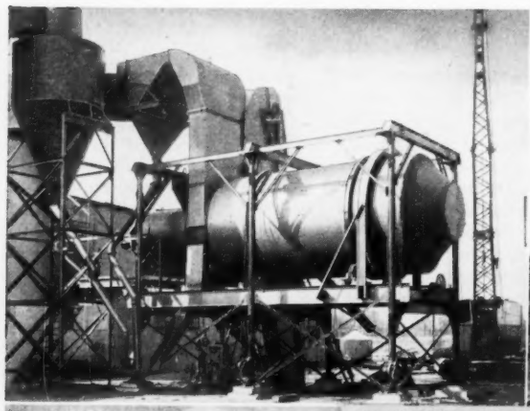
Zone 1 material which passed the 4-inch screen was carried by a Universal belt conveyor, 52 feet long and 36 inches wide, to a second hopper. A spraybar, attached to the discharge end of the conveyor, applied water to the material in the approximate amount required for optimum compaction. With this device in operation, very little water was added to the zone 1 material during placing operations.

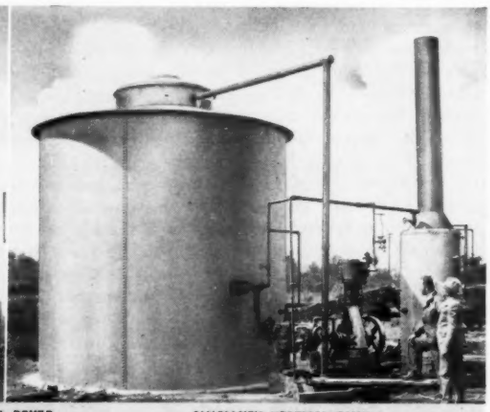
The second hopper, with a capacity of 30 cubic yards, was also fabricated on the job. It was supported on a tower of timber piles which was high enough to permit trucks to drive under it for loading. This hopper acted as a surge bin, permitting continuous operation of the screening plant to be correlated with intermittent loading of the trucks. A Universal apron feeder delivered the material from the hopper to a fleet of end-dump and bottom-dump Euclids which hauled to the dam. Approximately 700,000 cubic yards of material were processed through this plant.

Foundations

Before any of the fill could be placed, it was necessary to clear, strip, and clean up the site, and to excavate for foundations. Vegetation, topsoil, protruding boulders, and other objectionable materials, as well as unstable clay-like soils, were removed from the base of the dam and used to construct a cofferdam at the upstream edge of the structure. A Bucyrus-Erie 54-B and a P&H 655, using 2½ to 3½-yard Page and Hendrix dragline buckets, stripped the unsuitable materials and also dug a cutoff trench down to firm shale along both ends of the dam. A foundation trench 125 feet wide and 25 feet deep was excavated to the stable sandy soil which forms the foundation in the center portion of the dam. Euclids hauled the materials to the disposal area.

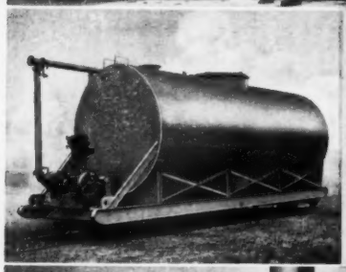
The foundation trench excavation was carried as deep as 25 feet through mud, sand, and water. Two Jaeger VD9 10-inch diesel-powered pumps were installed in sumps to hold down the water level during excavation. Perforated pipe drains



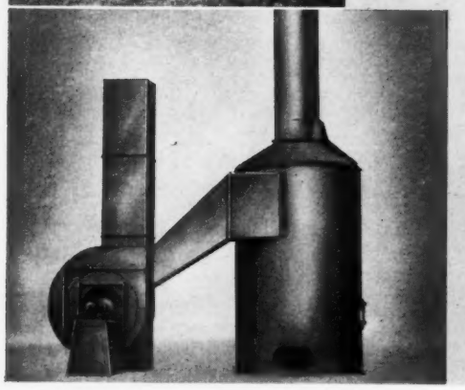


SIMPLICITY DOUBLE SHELL DRYER will increase production on any make of plant and pay for itself in fuel savings alone.

SIMPLICITY VERTICAL TANK (with "Hot Well"). Keeps only enough asphalt heated to required temperature to supply the plant. The "inner well" is insulated by the asphalt at lower temperature in the "outer tank."

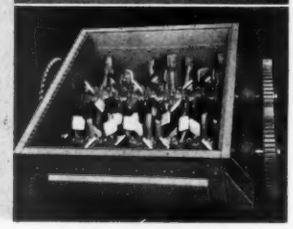


SIMPLICITY HORIZONTAL TANK (with "Hot Well"). This new Simplicity development follows the long established "inner well" principle in a horizontal tank.



SIMPLICITY FEEDER BIN for accurate feeding of coarse and fine aggregates. Two to four compartments.

SIMPLICITY AIRWASHER designed primarily for asphalt plants. Inexpensive but highly efficient in eliminating smoke and dust nuisance.



SIMPLICITY PUG MILL MIXER with Simplicity's exclusive double-zone mixing action.

SIMPLICITY STANDARD UNITS have improved the efficiency of other makes of asphalt plants. These improvements frequently pay for themselves on one job. Engineering recommendations on request with no sales annoyance.

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Messenger Vibrators

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Use "Messenger" Service

After the reservoir is cleared, ashes of burnt brush and trees are buried by Allis-Chalmers HD-20 tractors with Gar Wood dozers. Tractors and operator are protected from falling trees during clearing operations by a pipe canopy. *C&E Staff Photo*

were installed in the cutoff trenches to lead seepage to sumps during the early stages of embankment. After the fill had been carried above water level, the drain pipes were filled with clay grout.

Preliminary investigations had indicated that the underlying shale to be exposed in the cutoff trenches was fractured and required grouting. A grout cap 3 feet wide and 3 feet deep was poured in a trench in the shale, and 3-inch pipe nipples were set in the cap at 10-foot intervals. No grouting was done in the center portion.

Longyear gasoline-powered rotary drills, operating through the nipples in the grout cap, were used to drill holes up to 60 feet deep at 10-foot intervals along the axis of the dam. Grouting lagged behind the embankment work, and as a result, some of the holes had to be put down through as much as 40 feet of fill to reach the shale. These holes were cased through the fill, and the casings were withdrawn after grouting was complete.

A Gardner-Denver double-acting grout pump, operated by air from a Joy compressor, pumped the cement grout from an agitator tank through pipes and hoses to the holes. An average of 1½ sacks of grout per foot of hole was pumped, the maximum hole taking 1,399 sacks. Drilling and grouting operations were sublet to Mac Explorations Co., Riverdale, N. Dak.

Concrete Structures

Conduits for outlet and overflow structures were constructed in trenches, excavated on both sides of the valley, in the native material of the hillsides. Blaw-Knox steel forms were used for these conduits, and ready-mix concrete for the job was supplied by Lindberg Construction Co., Inc., Jamestown.

On other concrete structures, Economy steel wall panels were used for straight wall forms, while odd shapes were formed with conventional wood forms. The inside form for the hemispherical gate chamber was constructed entirely of wood, and the dome-shaped prefabricated form was set in place by a Koehring 601 crane.

Concrete was placed by one of the cranes, a Koehring 601, a Koehring 304 truck crane, and a P&H 655, which worked on the job. Gar-Bro and Blaw-Knox 1-yard buckets carried the concrete from ready-mix trucks to forms. Viber 213 and Thor 521 vibrators were used in placing the concrete, and air was supplied by a Gardner-Denver 500-cfm compressor.

Embankment

Backfill around structures received special compaction to make certain that no seepage would follow along the conduits. Gunderson-Taylor Triplex tampers worked in confined areas which could not be reached with sheepfoot rollers. A small single-drum sheepfoot roller, pulled by an International TD-9 tractor, was also able to work in areas where the larger machines could not be used.

Material for the impervious zone was excavated from the borrow pit by a Bucyrus-Erie 54-B shovel and loaded into end-dump Euclids which hauled to the screening plant. From the screening plant, other Euclids hauled the screened and moistened material to the embankments. Here Caterpillar D7 and D8 tractors with dozers spread the loose material in layers of about 10 inches. An Allis-Chalmers HD-20 tractor with a Gebhard double-drum tamping roller compacted the layers to a depth of

"We Haul 25,000 TONS of SLAG A DAY ON Firestone TIRES"

Edw. C. Levy Co., Detroit

Morton E. Harris, Executive Vice President, and Wm. Rafferty, General Maintenance Manager, talking to a driver with an outbound load of slag.

MORTON E. HARRIS

"An around-the-clock, 365-day-a-year operation like ours demands dependable, long mileage tires. It has been our experience that Firestone All Traction Logger Tires meet these requirements. That's why we use them."

(Signed) MORTON E. HARRIS
Executive Vice President
EDW. C. LEVY CO.

The Edw. C. Levy Co. is one of the largest processors of slag in the world. Every 24 hours and every day in the year the 500 units of the Levy fleet are on the job covering an average of 40,000 miles and moving 25,000 tons of slag in and out of the huge Levy plant in Detroit.

In an operation of such giant proportions, tires are extremely important. The standard tire equipment on the Levy fleet is the Firestone All Traction Logger. They are on this fleet because they stand up, give long mileage and hold downtime to a minimum.

Whatever your hauling job, Firestone tires will do the same for you. Have your Firestone dealer or store give you complete information. Ask him to show you how Firestone tires can speed up work on the job, cut downtime and reduce your over-all tire expense.

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6 inches. When additional water was needed for compaction, it was supplied from a 3,000-gallon tank trailer pulled by a Ford F8.

Pervious material for zone 2 of the upstream and downstream faces of the dam was obtained from a pit about 2½ miles west of the dam. Before starting to move this material, Lytle constructed a haul road with easy grades and a stabilized gravel surface which held up well under the heavy equipment. The P&H 655 dragline loaded the gravel material into three bottom-dump Euclids, while three Euclid scrapers loaded with the aid of an Allis-Chalmers HD-20 tractor.

The gravel was spread in 12-inch lifts, saturated with water from hoses, and compacted with crawler tractors. A 4-inch Gorman-Rupp pump supplied water through a pipe header to hand-held fire hoses. Additional water supply was furnished by a Johnson 5-inch turbine pump in an 8-inch-deep well.

Approximately 11,500 cubic yards of rock riprap was placed on the upstream face of the dam and around the intake structure to guard against erosion of the zone 2 material through wave action. An additional 5,000 cubic yards of riprap was used to line portions of the spillway and outlet works discharge channels. The crest of the dam is 30 feet wide and is intended for use as a roadway. Concrete guardrail posts, placed on either side at 25-foot intervals, run the full length of the crest.

Reservoir Clearing

Under a separate contract, Brasel & Whitehead, Riverton, Wyo., cleared and cleaned up the reservoir. Timber and brush were cleared from 1,300 acres of valley, and all buoyant material was either burned or buried with dirt. Some of the clearing was done with a Caterpillar D7 tractor equipped with a tree saw on its dozer blade. Another crew used McCulloch and Homelite chain saws to cut along steep river banks and hillsides. All tractors used for felling trees were equipped with pipe canopies to protect machines and operators. Two Allis-Chalmers HD-20 tractors, equipped with dozers and similar canopies, did the final cleanup. These machines bunched burning logs and brush together to keep them flaming. The ashes were pushed into holes and covered with earth.

A Badger crane, using a job-built hook-rake, worked along the banks of the river, cleaning out logs and brush from places inaccessible to other equipment. The odd-looking rake used on this machine was designed to pick up logs and brush without picking up dirt at the same time.

Late last year, when the dam had been completed but water not yet impounded, the North Dakota conservation department sprayed poison over the entire reservoir and its upstream tributaries to kill all fish. With undesirable species eliminated, edible fish will be planted in the impounded waters.

Personnel

For C. F. Lytle Co., B. D. McMillan was construction superintendent. He was assisted by C. F. Lytle, a nephew of the company's founder, who was concrete superintendent. R. D. Stewart was engineer for the contractor, and R. W. Eickbush was office manager. John Freeman supervised the reservoir clearing for Brasel & Whitehead.

The Jamestown Dam was constructed by the U. S. Department of the Interior, Bureau of Reclamation. P. E. Ehrenhard directed construction operations at the site. He was assisted by M. C. Wren, field engineer, and John R. Serumgard, office engineer. THE END

Spray and Suction Hose

■ Recommendations for a specific suction hose for each type of job are given in a new bulletin from the Quaker Rubber Corp., Tacony and Comly Sts., Philadelphia 24, Pa. Suction hose covered in this bulletin includes types used on typical construction pumping jobs.

The bulletin, illustrated by cross-section and cutaway photos, gives performance data, construction, sizes, weights, working pressures, and recommended uses. Information is also included on the various types of couplings used with the hose.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 727.

for *FASTER* handling and placing of concrete!

THERE ARE MANY EXTRA ADVANTAGES for you in the completeness of the GAR-BRO line. Every item of equipment is matched to work together. For instance, the clearance of floor hoppers and portable hoppers matches the height of carts and Power-carts. Only Gar-Bro makes such a wide variety of types and sizes of concrete buckets. All have patented double clamshell gates . . . all have attachments . . . and all have the fittings for easy attaching.

Whether the placing job is deep down into the narrow confines between reinforcing steel, or 40 feet under water, or high on the 54th floor of a concrete building, Gar-Bro Concrete Handling Equipment can help you deliver and place concrete easier, faster and better.

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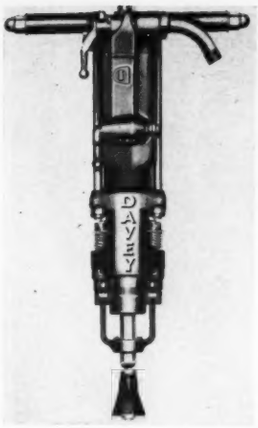
ECONOMY FORMS
metal forms for concrete construction



The Davey rock drill Model DS-58.

Offer New Rock Drill

■ A new medium-weight rock drill is announced by the Davey Compressor Co., North Water St., Kent, Ohio. The Model DS-58 is recommended by the manufacturer as a production tool for drilling both primary and secondary blast holes. Its net weight is 62 pounds and length is 24¼ inches.

The use of pneumatic pawls in the rotation ratchet instead of the commonly used mechanical pawls is a drill feature. These pawls are pushed out of engagement with the ratchet teeth at the time the ratchet starts to turn, thus eliminating rubbing wear on the pawls. The pneumatic pawls are so constructed that all four edges can be used before they are replaced. Other features listed are involute splines, chrome-plated cylinder bores, and rocket valves with double-trip ports for positive piston-hammer action.

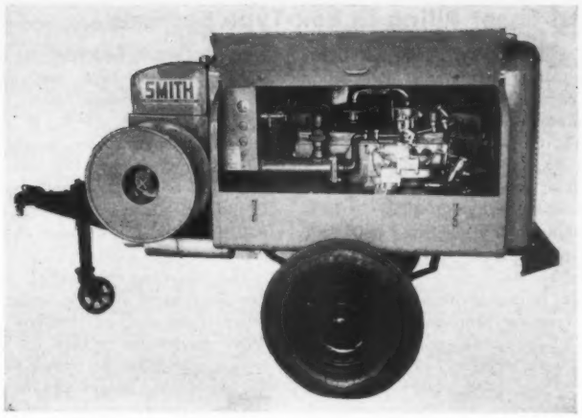
The rock drill is available in four types: blower, blast, wet with manual water valve, and wet with auto-water valve. Three rotation speeds can be furnished.

For further information write to the company, or use the Request Card at page 18. Circle No. 744.

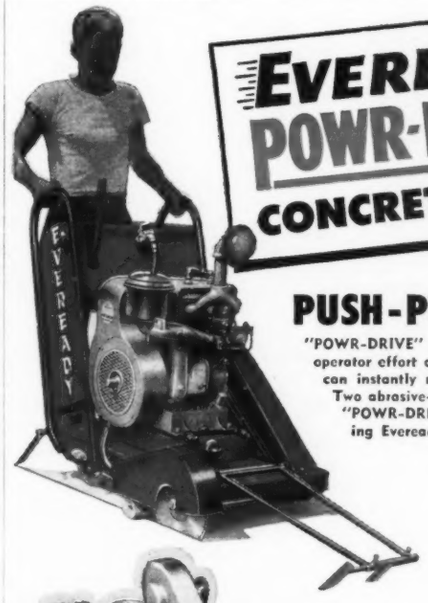
Lightweight Compressor Rated at 120 CFM

■ A lightweight trailer-mounted compressor capable of delivering 120 cfm of air is offered by Gordon Smith & Co., 425 College St., Bowling Green, Ky. The Smith Model 120-P compressor will operate two 80-pound paving breakers, two 80-pound sheeting drivers, a 50-pound rock drill, four backfill tampers, or two concrete vibrators. It is powered by a 39.7-hp Chrysler power plant. Advantages of the unit are that it can go where bigger compressors cannot be taken and can be towed at truck speeds from job to job.

The manufacturer states that the design of the compressor has been kept simple and compact in the interest of low maintenance. There is a minimum of fittings, gaskets, and gadgets to break down, and there are no couplings or clutches. Engine parts and service are available at Dodge truck dealers located in various sections of the country.



For further information write to the company, or use the Request Card at page 18. Circle No. 718.



EVEREADY POWR-DRIVE CONCRETE SAW

Ask Your EVEREADY Dealer for the Most Complete Line of Masonry and Concrete Cutting Equipment

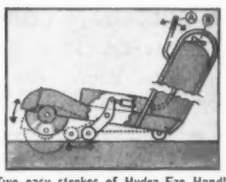
We've taken the PUSH-PULL Out of Concrete Sawing

"POWR-DRIVE" smoothly drives saw forward at your controlled speed . . . saves operator effort and increases cutting footage per day. With "POWR-DRIVE" you can instantly regulate the cutting speed to your various cutting requirements. Two abrasive-coated wheels act as a friction drive in contact with both rear saw wheels. "POWR-DRIVE" is engaged or disengaged by a convenient foot lever control. See the amazing Eveready "POWR-DRIVE" Concrete Saw at your local Eveready Dealer.

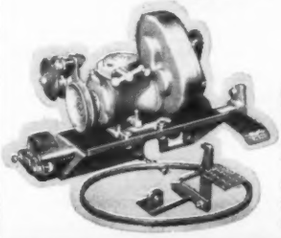
Red-I-Cut

PATENTED EVEREADY FEATURES

Shown at the right are three exclusive features that make EVEREADY the fastest, most efficient concrete and asphalt cutting saw. Other features are: Dashboard controls for greater ease in operation and maneuvering; blade depth control that permits sawing to a specified depth.

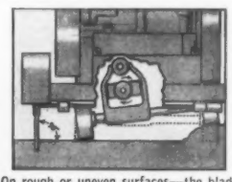


Two easy strokes of Hydra-Eze Handle (A) and hydraulic power lifts blade fast —straight out of cut. Quarter turn of Hydra-Eze Blade Release Lever (B) and hydraulic power feeds blade gently, smoothly into material.



BUY COMPLETE OR ADD THE NEW EVEREADY POWR-DRIVE KIT LATER

The "POWR-DRIVE" Kit comes completely assembled . . . only four holes—four bolts are needed to install the kit on any Eveready Concrete Saw. "POWR-DRIVE" Kits are sold only by authorized Eveready Dealers.



On rough or uneven surfaces—the blade on an EVEREADY Concrete Saw always cuts in a perfect, true, vertical plane. TRI-MATIC BLADE ALIGNMENT prevents binding, twisting, or tilting of the blade as the saw moves over uneven or broken surfaces.

"POWR-DRIVE" cuts MORE Concrete Every Hour . . . Cuts Costs on Every Job! and EVEREADY'S "PROVEN QUALITY" is Your Guarantee for "PROVEN RESULTS"!

EVEREADY Concrete Blades

EVEREADY RED-I-CUT DIAMOND BLADES

For faster cutting — PLUS maximum blade life — regardless of the type Concrete or Asphalt cut. Red-I-Cut Blades fit EVERY make and model saw.

EVEREADY TUFFIE CONCRETE BLADES

Cut Green Concrete at ONE-THIRD the cost! The NEW "TUFFIE" Abrasive Blade, reinforced with steel wire-mesh, cuts new highway slab—ALL "Green Concrete" slab—at unbelievable savings in labor and blade cost. Your dealer has it NOW!

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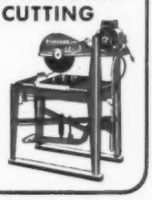

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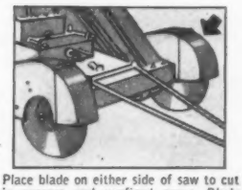
FREE BOOK on Masonry cutting . . . requested by more than 18,000 . . . will be sent without obligation . . . or ask your dealer.



Place blade on either side of saw to cut in corners and confined areas. Blade guard, water hose, and front guide wheel marker assembly are all interchangeable.

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in Most Principal Cities in the United States and Canada
Write for the Name of Your Nearest Dealer.
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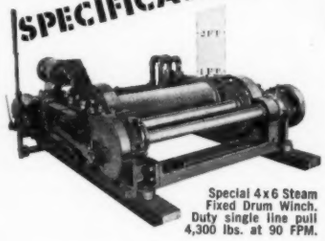
You SET THE SPECIFICATIONS . . .



Special 4x6 Steam Fixed Drum Winch. Duty single line pull 4,300 lbs. at 90 FPM.

Superior-Lidgerwood-Mundy has the facilities and experience to meet them . . . either from an all-inclusive line of standard hoisting equipment or with equipment engineered to your specific requirements.

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Steel Sheet Piling in Box-Type Sections

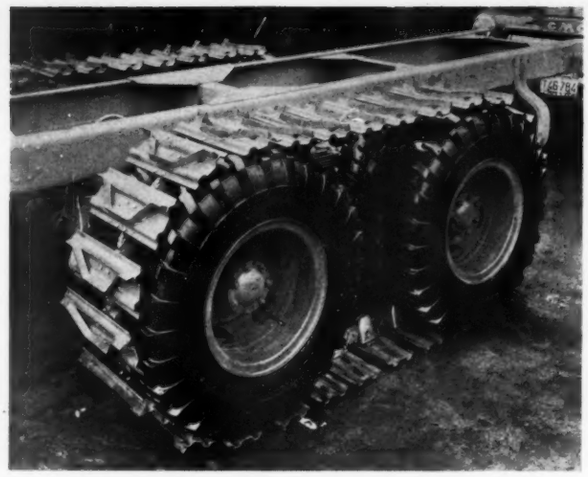
■ The development of a new lightweight interlocking steel sheet piling made up of box-type sections has been announced by the L. B. Foster Co., P. O. Box 1647, Pittsburgh 30, Pa. The piling is being manufactured of 8 and 10-gage steel in 12 and 15-inch laying widths. It is available in any length up to 36 feet. The piling is cold-rolled from hot-rolled sheets.

The piling is recommended by the manufacturer for installations which have been handled in the past with wood sheeting. These include shore protection, pier protection, sewer trenches, building excavations, abutments, bulkheads, cutoff walls, and cofferdams. It is not considered competitive with standard steel sheet piling. Advantages are that the piling can be used repeatedly, is easily handled in the field, and can be stored easily between uses.

The design of the L. B. Foster H. S. piling permits two sheets to be lapped together to form a watertight interlock, so that it is not necessary to slide one sheet into another for its entire length as in the case of standard steel sheet piling.

The box-type corrugation simplifies the use of bracers, wales, and other types of reinforcement. Another advantage is that the lightweight piling can be placed without the use of a rig. Sometimes the piling can be pounded in place by a maul or small air or steam hammer.

For further information write to the company, or use the Request Card at page 18. Circle No. 750.



The Galanot Tire Track can be mounted on the tires of a wheel-type vehicle to increase its tractive ability.

Tracks Aid Flotation of Wheel Tractors

■ A removable crawler-type track that gives rubber-tired vehicles extra flotation and tractive effort when traveling over mud, sand, or snow is offered by the Union Chain & Mfg. Co., Sandusky, Ohio. The Galanot tire-track is available in a large selection of shoe sizes and will fit a range of tire sizes from 6.00-15 to 18.00-26.

Built with variable shoe lengths and with versatile chain arrangements, the track can be applied to single or dual tires on either single or tandem axles. It will handle loads up to 60,000 pounds. Applications have been made to mobile cranes and shovels, trucks, trailers, wheel tractors, and graders.

The portion of the track between axles on tandem-axle applications remains rigid, preventing the track from putting strains or tensions on wheels and axles.

For further information write to the company, or use the Request Card that is bound in at page 18. Circle No. 707.

Overhead Sign Support for Highway Use

■ A new type of overhead highway sign support designed to provide for visibility while overcoming the bad effects of wind, ice loading, and other common problems is announced by the Union Metal Mfg. Co., 1400 Maple Ave., Canton 5, Ohio.

The overhead sign supports use the same principles applied in the company's Monotube continuous-taper cold-rolled street-lighting poles.

The company claims adaptability for the product in meeting a broad range of modern highway sign requirements, including split-second visibility in complex multilane systems. The sign is recommended for freeways, turnpikes, expressway interchanges, and other highway facilities.

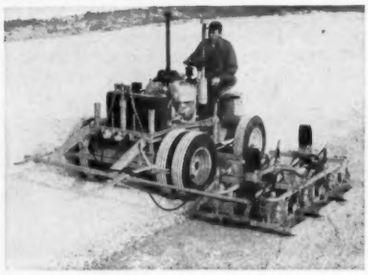
For further information write to the company, or use the Request Card at page 18. Circle No. 785.

The JACKSON VIBRATORY COMPACTOR
FAST • EFFICIENT • VERSATILE

ON MACADAM CONSTRUCTION . . . In one pass it will sufficiently compact 12" of rock to support smooth rollers. In four passes it achieves final density. And when sufficient fines are spread, one pass suffices to fill all voids. In GRAVEL SUB-BASES (blanket course) 7" thick, this machine has achieved 98% Standard Proctor in one pass. Standard width is 13', 3". Working speeds: 0-60 F.P.M. Reverse travel speed: 5½ MPH.

COMPACTS WIDENING STRIPS IN ONE PASS . . .

IN ANY GRANULAR MATERIAL used in flexible base-course widening. For this purpose compacting units are assembled in tandem, (3 deep, single or double row) and towed at side of tractor. Compactor bases of 12" and up may be substituted for standard 26" bases to suit requirements.



SAND FILLS, SUCH AS BRIDGE APPROACHES . . . another spot in which this machine shines. It's rapid and gets into places inaccessible to larger equipment. For the really tight spots one or more of the compacting units may be fitted with operating handles and used as self-propelling, manually guided compactors.

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An Extra Heavy Duty Extension Rule That Stands Up On The Job!

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- Triple-locking solid brass joints maintain accuracy
- Solid brass strike plates prevent wear
- Graduations on both edges of the rule
- Markings and graduations *embedded right into the wood*
- Bold easy-to-read figures
- Brass extension for accurate inside measurements has black-filled figures and graduations for easy reading
- Durable boxwood finish further protected by tough clear plastic coating

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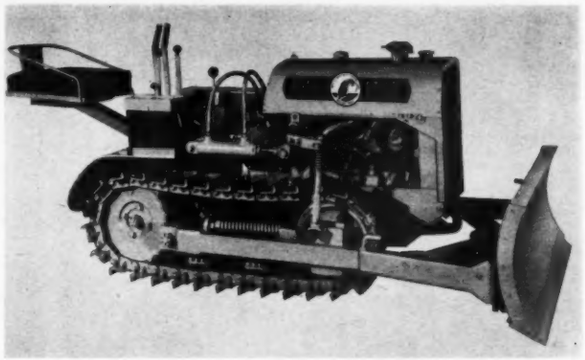
Small Crawler Tractor Has Angle-Blade Dozer



■ A small crawler tractor equipped with a combination bulldozer-angle blade has been announced by the Mity-Kat Tractor Corp., Corporation Way, Medford 55, Mass. The blade is hydraulically operated, may be used in angle or straight position, and has a tilt feature for ditching. It is 51½ inches across, 18½ inches high, lifts 15¼ inches, and drops 6¼ inches below grade.

The Mity-Kat tractor is suitable for light excavation, grading, and road construction and maintenance work. For snow removal, this machine can use a larger blade than is normally supplied for grading and backfilling work. The 2,350-pound tractor is powered by a 4-cylinder Hercules engine that delivers 18 brake hp at 2,300 rpm. It runs on tracks 55½ inches long and 6 inches wide, with a width between tracks of 21½ inches.

The tractor is equipped for two continuous-running power takeoffs, one from the clutch housing and the other from the rear-end cover. Each has an individual disengaging clutch. Other special features include a quick-reversing clutch running in oil that permits the tractor to be reversed at any speed range without changing gears.

Among optional equipment available are a special attachment for using kerosene fuel, a front and a rear power takeoff, a 6,000-pound-capacity winch, a self-priming pump adaptable to the front power takeoff, a disk trencher, and a belt pulley. A snow blade, 63 x 27⅞ inches, is also available for the crawler-mounted machine.

For further information write to the company, or use the Request Card that is bound in at page 18. Circle No. 735.

Bulletin on Installation of Standby Generators

■ A technical bulletin covering the installation of emergency standby electric generating plants and automatic line transfer controls is offered by D. W. Onan & Sons Inc., University Ave., S. E., Minneapolis 14, Minn. The bulletin covers subjects of more or less technical nature in simple language.

Descriptions of the plants and methods of control, as well as wiring diagrams, are included in this booklet. Typical installations of both water-cooled and air-cooled plants are pictured.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 787.

Cart for Masonry Saw Makes It Mobile Cutter

■ The cutting head of a standard masonry saw can be mounted on the new Champion concrete cart to form a machine for cutting concrete. Such a unit can be used for cutting concrete flooring, large lintels, or pieces of stone, and also for patching, trenching, and other uses. With the addition of guide rollers and with a track mounting, it can also be used for cutting large slabs of stone, sheets of Transite, and similar materials.

The cart is equipped with individual front-wheel suspension that protects the blade from binding. A positive screw feed and depth lock gives the operator good control. The unit rides on rubber-tired wheels. The cart is also available complete with single and dual cutting heads with electric motor or gasoline-engine power units.

For further information write to the Champion Mfg. Co., 2028 Washington Ave., St. Louis 3, Mo., or use the Request Card at page 18. Circle No. 766.

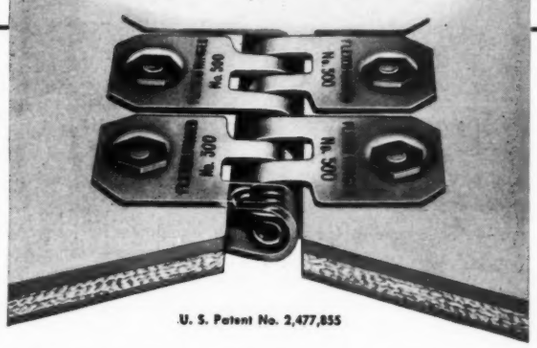
Replacement Cartridges For Oil Filtration

■ A catalog on its oil filtration replacement cartridges is available from W. G. B. Oil Clarifier, Inc., Kingston, N. Y. The literature lists specifications for WGB fabric-covered and can cartridges. A series of charts help to select the proper replacement cartridge for each specific manufacturer's equipment.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 717.

... the new separable

FLEXCO HINGED BELT FASTENERS



U. S. Patent No. 2,477,855

- For joining grader, trencher, ditcher and other earth moving conveyor belts.
- For belts ⅜" to ½" thick.
- A FLEXCO fastener that is HINGED. Has removable hinge pin.
- Troughs naturally, operates through take-up pulleys.
- Strong, durable . . . pull or tension is distributed uniformly across joint.

Order From Your Supply House. Ask for Bulletin HF 500.

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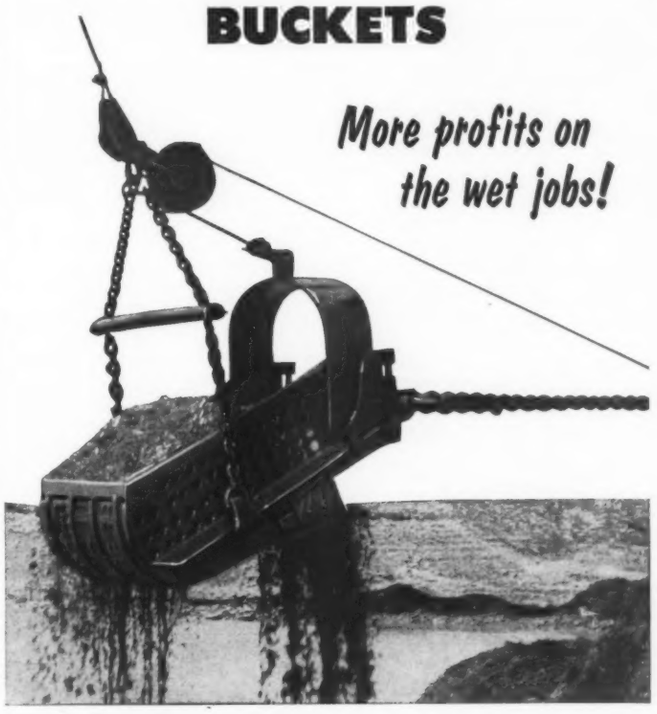
WELLMAN-WILLIAMS

PERFORATED DRAGLINE BUCKETS



THE Wellman-Williams Perforated Dragline Buckets have welded stiffeners the full length of the bucket for maximum strength and rigidity. Alloy steel construction gives maximum strength with minimum dead weight. Teeth are made of manganese steel and are reversible.

Hitch connections can be easily adjusted to any desired digging depth. Gives the operator a wide digging range for faster work.

Solid plate type dragline buckets also available.

It's a WELLMAN — built to dig and last while digging.

THE WELLMAN ENGINEERING CO.
CLEVELAND 4, OHIO

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Please send me a free copy of bulletin on:

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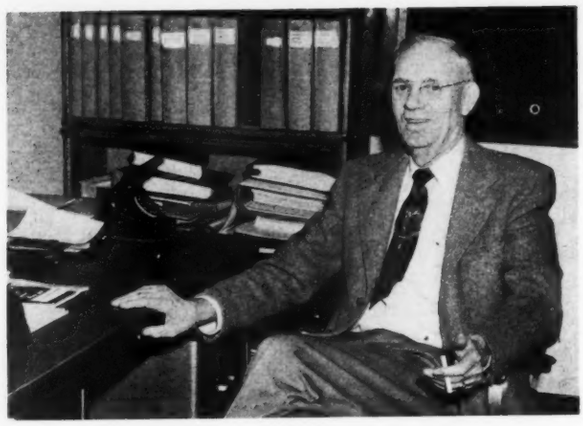
Proper care of equipment and training programs for operators are this highway department's

Keys to Maintenance



Fred Cummings, superintendent of maintenance equipment for the Colorado State Highway Department, in his Denver office. Frequent inspection trips to equipment spreads allow him to check on the condition of the state's machines. *Ray Day Photo*

A HUGE and unexpected rock slide, roaring down a Colorado mountainside and across a major highway, blocked the road with 70,000 cubic yards of material. Within minutes, the state's maintenance forces had power shovels, Dumptors, and trucks on the way to the scene. Air compressors and jackhammers were rushed to the area. Powerful tractors, loaded on low-bed trailers, were shuttled to the job. Work went on day and night until a temporary passage had been made through the blocked road. And within three weeks, the entire yardage had been cleared away.

This is but one of the many instances in which Colorado's policy of good equipment upkeep has paid off. Underlying the organization's operation-maintenance-repair program is this one dominant idea: equipment must be ready to do its job at all times. In cases where machinery breaks down, every effort is made to hold downtime to an absolute minimum. Like any contractor's organization, the state considers it a tragedy for a tractor to be down more than a day. This is the thing most impressed on the crews by Fred Cummings, superintendent of maintenance equipment for the State Highway Commission.

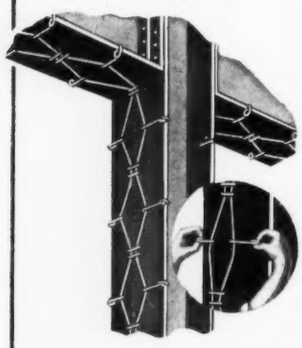
Cummings, who has worked for many years in both equipment and highway maintenance, realizes that equipment can get work done faster and cheaper only if it is maintained in topnotch condition. Handling the job of keeping the state's equipment in good shape, Cummings makes sure his men give their equipment the best of care. Routine inspection trips to equipment spreads throughout the state are one of the means he uses to keep tabs on his men and machines. On one of these trips, he came across a motor grader which hadn't been lubricated for weeks and which had an engine full of grit and dust. When he called it to the attention of the operator, the operator said half jokingly:

"It might not be a bad idea to let this one go, Mr. Cummings. Maybe then I'll get a new piece of equipment."

But Cummings' idea was different. "You know what the rules are about keeping equipment in top shape," he said. "If I had any new equipment to pass out—and if I selected the operator to run that machinery—I'd pick out the man who had shown me he was able to take care of that equipment. The last person who'd get it would be a man who abuses good equipment as you've done here."

When Cummings next visited the job, the grader was in top shape. It had recently been lubricated and steam-cleaned. And another opera-

expansible reed clips



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BUILDING and CONCRETE SPECIALISTS

Extensively used on various types of steel structures, here's a soffit reinforcement for fireproof construction whose design and quality is superior to any other reinforcing material available. These CONVER expansible reed clips give proven efficiency when reinforcing thin protective layers of concrete.

- RIGIDITY ASSURED. Made of either #12 or #10 gauge galvanized steel wire; all members electrically welded. May be cut into any size or shape. Clips 12" or 9" on center.
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For additional information on our full line of building and concrete specialties, write for the free current, detailed CONVER Catalog. Just fill in and mail coupon below.

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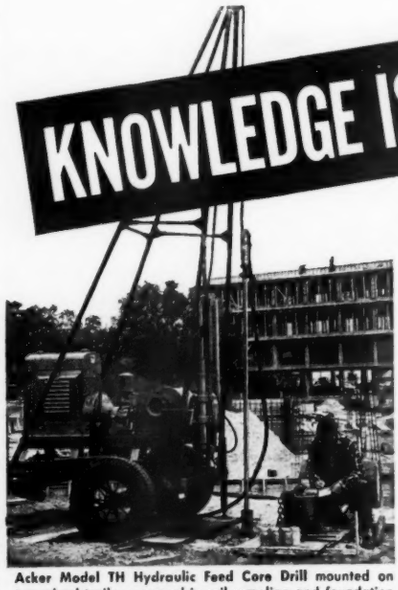
KNOWLEDGE IS POWER



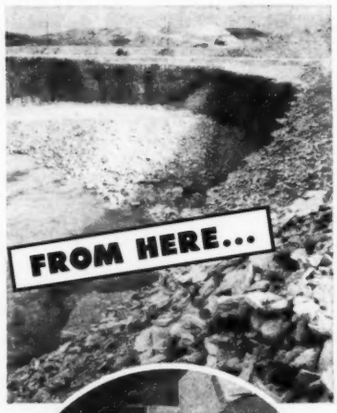
Acker Model TH Hydraulic Feed Core Drill mounted on two wheel trailer engaged in soil sampling and foundation test boring for a new building.

This Acker drill owned by a leading Southern University, is used not only for instructing engineering students, but commercial testing as well. In the latter capacity, it is in much demand by State governmental engineering departments for soil sampling and foundation test boring.

To see why Acker drills are preferred by leading engineers everywhere, write for Bulletin 30, C&E.

ACKER DRILL CO., Inc.
725 W. Lackawanna Avenue
Scranton, Penna.
A complete line of Diamond and Shot Core Drills, Drilling Accessories and Equipment

Best Route:



Eagle equipment — both hammermills and jaw crushers — bring a wealth of experience to your crushing problems.

Made to last — made to be serviced economically — they offer the best route to profitable operation.

Free engineering consultation on your crusher problems — write or phone for detailed specifications!

EAGLE CRUSHER CO., Inc. GALION OHIO-U.S.A.

tor had learned his lesson well.

But examples such as this are rare. Cummings has long since been forced to make them so. Under his supervision is a fleet of construction machinery worth millions of dollars. The state must maintain that equipment to keep depreciation at a minimum. The depreciation period is 10 years for a motor grader, compared to the average 5-year depreciation normally assigned to such a unit by contractors.

Few master mechanics for large contracting organizations have as broad a range of equipment under their supervision as Cummings. Colorado's equipment fleet includes such items as 225 heavy-duty four-wheel-drive trucks, 40 light-duty four-wheel-drive trucks, 250 trucks of 1½ to 2-ton-type, 134 motor graders, 8 hot-mix asphalt plants, 12 truck-mounted rotary snowplows, 12 truck-mounted rotary snow wideners, and 6 motor-grader-mounted rotaries. The state's list also includes 30 asphalt distributors, 15 tank-car heaters, 18 shovel and dragline combinations, 3 major rock-crushing plants, 16 tractors with dozers, and hundreds of items such as Wood Preparizers, Gradalls, heating kettles, concrete mixers, pumps, air compressors, pneumatic drills, and small tools.

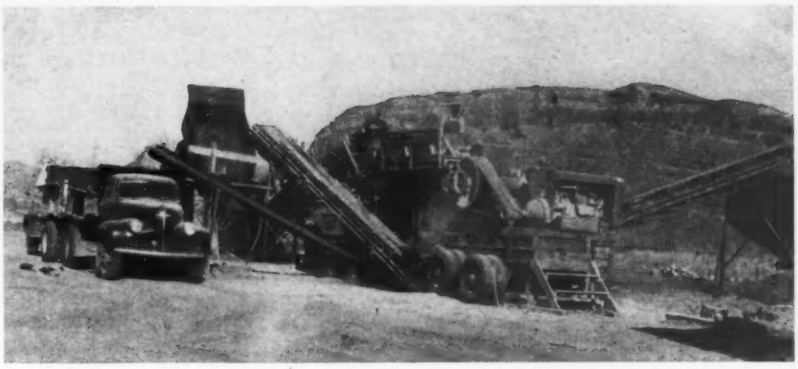
Centralized Organization

Colorado's centralized equipment department, working closely with the Bureau of Maintenance, is representative of the modern trend in highway organization. Cummings works in cooperation with James D. Bell, maintenance engineer, to get machines on his list which will best perform the required maintenance operations.

Many of the machines, especially trucks and motor graders, are assigned permanently to a district, or to a section within a district. For this reason, it is important to have the proper kind of machinery to do the job. The entire equipment organization is centralized under Cummings' supervision in the Denver office, and key men in that organization are scattered over the state. Colorado has seven district offices, and in each district shop is an average of six mechanics. Supervising these men at the district level is a shop foreman. All the routine arrangements for daily service are also made at this level. Most of the mobile equipment carries its own lubricating devices, along with a fuel tank and oil supply. At stationary setups such as rock-crushing plants, there is also provision for lubrication and fuel.

The wages of mechanics and foremen, together with the cost of fuel, spare parts, and supplies are chargeable as a routine maintenance cost. Formerly, the state programmed a budgeted item for equipment maintenance. Last year, this method was changed so that a daily charge, on a rental basis, is made on the district to which the machine is assigned. Sample rental fees include $12.10 for heavy-duty four-wheel-drive truck-mounted snowplows; $2.41 for 1½-ton dump trucks; $13.35 for a 1,000-gallon asphalt distributor; $5.25 for a ¾-yard front-end loader; and $11.20 for a large motor grader A rock-crushing plant of the Cedar-

(Continued on next page)



A rock-crushing plant is kept busy throughout the short working season. Machines like this, carefully selected to do a certain job, are often assigned permanently to a district.

IH PHOENIX "ROUNDUP"

IH Stages the Greatest Earthmoving Show on Earth

New, complete INTERNATIONAL line introduced to world-wide distributor organization at Industrial Power "Roundup"

Promptly at 9:00 A.M. recently, a barrage of aerial bombs exploded over the desert south of Phoenix, Arizona.

The explosions signaled the start of the greatest show ever presented by an individual heavy equipment manufacturer—the introduction of the new INTERNATIONAL Industrial Power line.

The International Harvester Industrial Power "Roundup" was a three-day presentation of more than 80 pieces of heavy earthmoving equipment, materials handling machinery, diesel and carbureted engines and power units in the new, expanded INTERNATIONAL Industrial Power line.

But the 612 INTERNATIONAL Industrial Power Distributors, their bankers and associates from the United States and 24 foreign countries got more than a first look at the big parade of IH Industrial Power.

They saw the answer of IH to the present and future requirements of one of the world's biggest industries—construction.

As an IH official told them, "There's no foreseeable end to the present heavy construction boom. We are determined to anticipate the demand and to build machinery necessary for the continual economic development of America and the free world."

HIGH ON A HILLTOP, Bill Hall and his new, 155 drawbar horsepower INTERNATIONAL TD-24 crawler tractor, command a view of IH's 4200-acre Phoenix Proving Grounds, site of the recent INTERNATIONAL Industrial Power "Roundup."

INTERNATIONAL HARVESTER

INTERNATIONAL

MAKES EVERY LOAD A PAYLOAD

On the pages following, you will see the whole story, in pictures, of this great demonstration event. Just turn the page to start your own visit to the INTERNATIONAL Industrial Power "Roundup."

This road-mixer, like most of the other state highway equipment, is busy on Colorado roads throughout the summer. Because of the wind and dust, frequent cleaning of these units is necessary.

rapids Junior Tandem type is rented for $10.85. The highest fee on the list is $39.65. This is for a rotary snowplow mounted on a motor grader.

Standardization

The range of maintenance work and the use of competitive bidding in procurement make standardization of equipment almost impossible. However, the state strives to standardize wherever it can. After equipment specifications are assembled and turned over to a central purchasing department, copies are mailed to all distributors who might be prospective bidders.

In order to allow the State Highway Commission some leeway in selecting the machine with the most favorable features, a comparative analysis of the bids is posted for inspection. While the commission is not bound to accept the lowest bid, it usually does so unless definite advantages are apparent in the next higher bid.

Colorado makes it a policy to use standard makes and models of equipment. Among other advantages, these makes are dependable, repair parts are easy to get, and excellent maintenance information is available for them.

There are a few exceptions to this rule. One of the odd "Joe McGee" machines used by the state is a combination of a truck-mounted Athey loader, a large steel distribution chute, and a Buckeye spreader box. This machine is used in connection with 2½-yard dump trucks for sealcoat work during the summer.

The state also standardized several years ago on a unique snowplow mounting for trucks. This mounting has long structural-steel arms which transfer the pushing force to a point close to the rear end of the truck. It can be adjusted for all makes of trucks the commission uses.

Stresses Upkeep

Cummings found long ago that equipment operation and maintenance which adds thousands of hours of service life to a machine combines a system of inspections, reports, and education.

So far as inspections go, they are frequent and thorough. Cummings himself makes it a point to visit each district headquarters at least twice a year. In addition to these routine inspections, he makes frequent spot checks. On one of these checks, he found a push-plow which had come into a shop with its blade worn out. Cummings had worked out a shoe which rides above the pavement line until about 5½ inches have been worn off the snowplow's 6-inch blade. And the only way an operator can wear out the moldboard is to screw the shoe adjustment up to the point where it will do damage. This was prima facie evidence of gross negligence, and Cummings did not hesitate to call it that.

The rules which Colorado uses are no tougher than those in the manufacturer's maintenance bulletins. Cummings believes there is nothing mysterious about equipment upkeep when these recommendations are followed to the letter.

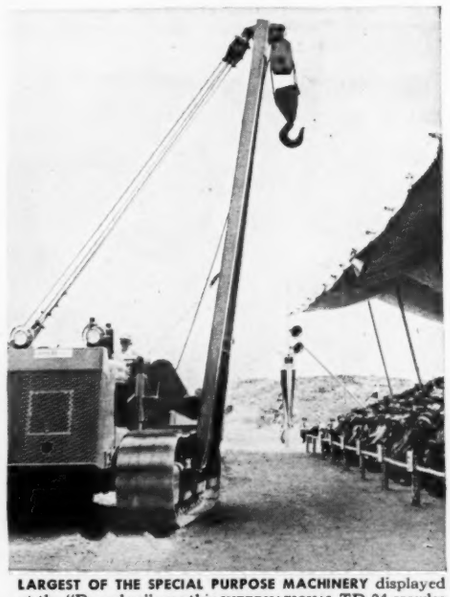
Many of the things which prolong equipment life consist of simple tasks. Proper lubrication is simply a matter of using the right lubricants in the right fittings at the right time. There is no piece of equipment on the list which is too complicated to be lubricated by any intelligent operator or mechanic after a short instruction period. And yet the matter of lubrication is Cummings' biggest problem.

Since many of Colorado's summer jobs are done in dust and wind, it is necessary that air filters be cleaned at short regular intervals. Yet air filters are sometimes found to be in-

PHOENIX "ROUNDUP"

"ROUNDUP" AUDIENCE gets first look at new 155 drawbar horsepower INTERNATIONAL TD-24, world's most powerful crawler. The TD-24, with matched hydraulic or cable-controlled blade, handles the toughest "pioneering" jobs.

PROUDLY PROCLAIMING THEIR SUPERIORITY in their horsepower field, a trio of INTERNATIONAL TD-18A crawler tractors park in front of the "Roundup" grandstand for audience inspection and approval.



LARGEST OF THE SPECIAL PURPOSE MACHINERY displayed at the "Roundup" was this INTERNATIONAL TD-24 crawler with matched Superior sideboom. TD-24 boom tractor will lift up to 45 tons.

TWO NEW PRODUCTS FOR ACCELERATED EARTHMOVING pass the "Roundup" grandstand. Rubber-tired earthmover is the INTERNATIONAL 2T-75, with 18-yard heaped capacity and a top speed of nearly

"Every Load

At the Phoenix "Roundup", INTERNATIONAL showed its distributors a lineup of "phased" equipment specifically designed to meet the requirements of the construction industry.

Included in the long list of equipment were new crawler tractors, ranging in size from 20-ton mountain-moving giants to basement excavators; high-speed units that haul half a railroad car of earth each load;

READY TO TEST A NEW INTERNATIONAL 2T-75 is IH vice-president Harald T. Reishus. Instructions for the run are given by C. E. Jones, assistant sales manager. Holding stop watch at the right is sales manager I. P. Payne. Cactus in picture is famed Arizona saguaro.

sufficiently cleaned. To be cleaned properly, an air filter must have the element removed and cleaned, the breather pipe looked into, and the filter body freed of dirt and grit and refilled with fresh oil of proper viscosity. Cummings stresses that engines must also be kept clean. If the outside of an engine is clean, it is practically impossible to knock dirt into the oil system when the refill cap is off. Done at regular intervals, this cleaning job pays off, Cummings believes, in many added hours of life for the machines.

Of all the factors in his equipment program, none is more important than the education phase. A considerable part of his regular inspections deal with education in the field. Once a year, the district maintenance foreman of equipment and two of his best lead mechanics spend about a week in Denver. During this time, all the local distributors, and in some cases, specialists from the manufacturing firms conduct service schools to train these men in the latest techniques of equipment repair and maintenance. At these meetings, better methods of operation, better repair methods, and the cause and remedy of "bugs" in modern equipment are discussed. The men have an opportunity to ask questions, and they invariably come away from these meetings better equipped to handle their machines.

Operation Emphasized

Educating men in operational procedures, Cummings believes, is just as important as equipment-repair education. The proper operation of equipment—a vital factor in the equipment's service life—usually comes up for regular discussion at district meetings. Through these meetings, operators, can be shown ways to keep their machines operating at a steady pace without breakdowns. And good operators, through this program, are becoming even better.

Cummings sums up the relationship of equipment to work in this way: "1954-model construction machinery is the finest this country has ever seen. It will do a good job at almost fantastic production rates, both as to volume and cost. But it takes a great deal of judgment to select it properly, and even more to operate and maintain the machines so that they turn out the work.

"I know of no better maintenance bible than the manufacturer's own instruction manuals. If we follow these recommendations, we can save an impressive number of extra pennies to invest in machinery."

THE END

25 mph. Pusher is the new 200 horsepower INTERNATIONAL TD-24 torque converter crawler tractor. These are the largest units in the line, which now includes more than 80 pieces of equipment.

THE NEW INTERNATIONAL TD-24 TORQUE CONVERTER gets a thorough going over by a group of distributors. With same dimensions as conventional TD-24, all equipment that fits the conventional TD-24 fits the torque converter model.

...da Payload"

...a torque-converter tractor that operates as smoothly ...s chauffeur-driven limousine; equipment equally adept ...t stockpiling bags of concrete or crates of china; and ...power units capable of lighting a medium-size city.

By putting the proper piece of equipment on each ...phase of the earthmoving job, INTERNATIONAL Distributors can show their customers how production profits ...ise while operating costs fall.

FAST-STEPPING GIANTS PERFORM FOR CROWD. Boss of the heavy earthmoving jobs is this largest crawler tractor-scraper combination manufactured today. Crawlers are the new 155 drawbar horsepower INTERNATIONAL TD-24s. Partner in this big earthmoving act is the new INTERNATIONAL B-250 a 27½-yard heaped capacity push-loaded scraper.

Turn the page for more "Roundup" news

Electronic Audit System Speeds Toll Collection

■ A new toll collection and audit system, using a combination of photoelectric eyes, weighing treadles, and toll recorders performs all weighing and counting operations while the vehicle is in motion, and checks the toll attendant's classification of the vehicle. The system has been developed by the International Business Machines Corp., 590 Madison Ave., New York 22, N. Y.

As a vehicle approaches the toll booth, a weight treadle built into the traffic lane's pavement separately weighs each axle, and a photoelectric detector counts the number of axles. At the same time, a toll attendant determines by visual inspection the number of axles on the vehicle and depresses a corresponding key on the recorder. This automatically totals the individual axle weights and registers the vehicle's classification, along with other necessary information, on a fare card.

An axle group indicator atop the toll recorder lights up to display the axle pattern of the vehicle if the operator depresses the wrong axle key, and the recorder locks to prevent improper validation of the fare card. The fare card, indicating the amount to be paid for the trip, is given to the vehicle operator, who presents it at the exit gate with his toll where the equipment automatically rechecks the data.

Without additional key-punching of information into these cards, the central auditing may be completed by IBM's Type 650 calculator. This new "brain", in one pass of the fare cards, will compute all revenue, compile traffic density data, total charges by account number, and provide a means of quickly auditing the collectors' daily work report.

For further information write to the company, or use the Request Card at page 18. Circle No. 751.

Hall Machine Works Gives Sales Rights to FWD Co.

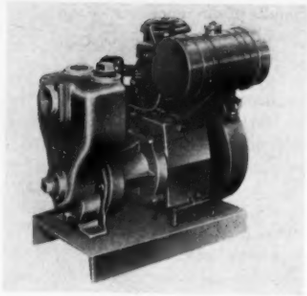
Exclusive sales rights for all products manufactured by the Hall Machine & Iron Works, Sedro Woolley, Wash., has been granted to the Four Wheel Drive Auto Co., Clintonville, Wis., under the terms of a contract signed by both companies.

The Hall organization manufactures a heavy-duty brush cutter, brush hog, and a tailgate spreader. Retail sales development for the roadside brush-control equipment will be under the direction of Robert Rasmussen, sales manager of the Allied Equipment Division of FWD.

Self-Priming Pumps For Water Drainage

■ An improved line of lightweight self-priming centrifugal pumps is announced by the Universal Mfg. Co., 3333 Eastshore Highway, Richmond, Calif. Features include a balanced priming port that prevents loss of volume from recirculation of water, nonclogging semi-open impellers with adjustable clearance to compensate for wear, and a new convertible wear plate to prevent wear on the impeller case.

Priming is done, without extra fittings or disturbance to the piping, through a separate opening in the



top of the pump case. The pumps are rated for continuous duty as well as for intermittent service.

The new heavy-duty units are especially suited for use by the building contractor for dewatering excavations. They handle muddy water and are available in a wide range of horsepower ratings with a choice of electric motor, gasoline engine, or heavy-duty transmission head for a belt drive.

The pumps are also offered with a lightweight two-wheel hand trailer with ball-bearing-type wheels and semipneumatic tires.

For further information write to the company, or use the Request Card at page 18. Circle No. 804.

Accidents don't happen; they are caused. Safety always pays.

CHARGE OF THE HEAVY BRIGADE. Part of the equipment used in the "Roundup" leaves the assembly "corral" for demonstration sites on IH's Phoenix Proving Grounds.

Demonstration—Cornerstone of IH Distributor Sales

In only one respect did "Demonstration Day" differ from any other day at the IH Phoenix Proving Grounds: grandstands were erected at each of 10 demonstration sites where distributors could see equipment in action.

Other than that, everything was the same. All equipment went through standard demonstrations and test runs.

Phoenix is only the first "torture" session for IH earthmoving equipment. Additional tests and demonstrations are conducted, year round, at other IH proving grounds and on actual jobsites.

A lengthy and expensive process, but one that assures contractors of this fact: INTERNATIONAL Industrial Power means more power, more speed, greater durability and less operating expense on any earthmoving or heavy construction job.

Your INTERNATIONAL Industrial Power Distributor will gladly arrange a demonstration of the model in the new, complete INTERNATIONAL line "sized" for your job. Let him prove that putting INTERNATIONAL Industrial Power equipment on the job puts more profit in your pocket.

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TAKING ADVANTAGE OF A COFFEE BREAK are (l to r) Governor Howard Pyle of Arizona, "Roundup" host, Harald T. Reishus, vice-president, International Harvester and John L. McCaffrey, president.

Books on Roadsides, WASHO Test Project

Two new publications dealing with aspects of road construction and maintenance are available from the Highway Research Board. One deals with "Roadsides, Their Use and Protection", and the other is a report on the WASHO road test.

Special Report 17 is a symposium on the use, protection, and maintenance of roadsides. It is made up of papers presented at the 32nd annual meeting of the Highway Research Board. The subject is discussed from the point of view of the highway designer, the traffic engineer, the planner, the motorist, and the public. Summaries and sample questionnaires are used to present a cross section of professional opinion.

Design, construction, and testing procedures used on the WASHO road test are treated in the second publication, Special Report 18, which is the first of two final reports on the test stretch two miles north of the Idaho-Utah border. The project is comprehensively described, methods of test operation are detailed, and instrumentation and procedures are given. The purpose of the report is to provide, by presenting complete data on construction and operation of the project, a thorough understanding of the conditions imposed on truck traffic during the test. Results will be presented in a report scheduled for publication next year.

"Roadsides, Their Use and Protection" is priced at 75 cents, and the WASHO Road Test, Part 1, is priced at $2.25. Either publication may be obtained by writing to the Highway Research Board, 2101 Constitution Ave., Washington 25, D. C.

Tubes Driven by Mandrel Make Cast-in-Place Piles

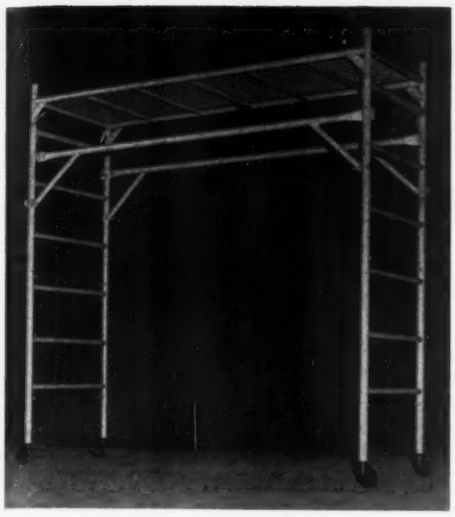
■ Literature on the Cobi pneumatic mandrel, a device for driving thin-gage corrugated pile shells into the ground, is offered by the C. L. Guild Construction Co., Inc., 94 Water St., East Providence 14, R. I. When driven into the ground, the shells are filled with concrete to make a cast-in-place concrete pile.

The literature gives details on the four phases of the pile driving. The mandrel, in its collapsed state, is ¾ inch smaller in diameter than the shell. It is inserted into the shell, inflated with 125-psi pressure to grip the sides of the tube, and the shell is then driven. The gripping mechanism is made of a nylon-reinforced circular rubber tube that fits inside a square-shaped tube of the same materials. As these tubes are expanded, four curved steel plates grip the inside of the corrugated shell.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 723.

Pettibone Wood Appoints

L. W. Wichman has been named sales engineer for the midwest area by Pettibone Wood Mfg. Co., North Hollywood, Calif. Mr. Wichman will make his headquarters in Omaha, Nebr., and will do field work with dealers handling the road-building equipment manufactured by Pettibone wood.



The Handyman scaffold offered by Bil-Jax, Inc.

Portable Scaffold

■ An all-steel portable scaffold designed to roll through doorways and give access to hard-to-reach places, has been introduced by Bil-Jax, Inc., Archbold, Ohio. The single unit requires only nine parts, including the expanded metal platform.

If planking is desired in place of the metal platform, the latter can be replaced with conventional braces. The planking then can be placed crosswise on the braces or lengthwise on the ladder rungs.

The end ladder sections for the Handyman scaffold are available in 3, 4, 5, and 6-foot heights. Where platform heights of less than 3 feet are desired, casters may be inserted into the metal platform sockets, eliminating the need for ladder sections. Multiple units 2, 3, 4, or more sections high, used singly or in tandem, permit a variety of setups.

For further information write to the company, or use the Request Card at page 18. Circle No. 805.

Hyster Sales Engineer

Les Jensen is the new eastern division sales engineer for Hyster Co., Portland, Oreg., manufacturer of material-handling equipment and tractor tools. With the company's engineering department for the past seven years, Mr. Jensen was assistant to the supervisor of industrial truck design.

Short Belt Conveyors Of Standard Components

■ Components that may be assembled to form belt conveyors ranging from 8 to 44 feet in length, in increments of 1 foot, are described in new literature from the Barber-Greene Co., 400 N. Highland Ave., Aurora, Ill. The booklet points out that, heretofore, conveyors under 40 feet in length have either been made up from components designed for a higher horsepower than was needed or have had to be specially designed.

Mounted on a 5-inch channel frame, the transfer conveyors are available in 18, 24, and 30-inch belt widths. Units up to 20 feet in length are shipped factory assembled except for carriers and belt. Capacities range from 50 to 480 tons per hour, depending upon belt width and the weight of the material being handled.

Electric power units, crowned steel head and tail pulleys, 4-inch-diameter ball-bearing Barber-Greene troughing carriers, and full Alemite lubrication are among features offered.

To obtain information write to the company, or use the Request Card at page 18. Circle No. 780.

Baker-Lull Names Manager

John A. Miller is representing the Baker-Lull Corp., Minneapolis, Minn., as southern district manager for Shoveloader material-handling equipment. He is in charge of all sales promotion and distributor relations. His new territory includes Alabama, Florida, Georgia, Louisiana, Mississippi, North and South Carolina, and Tennessee.

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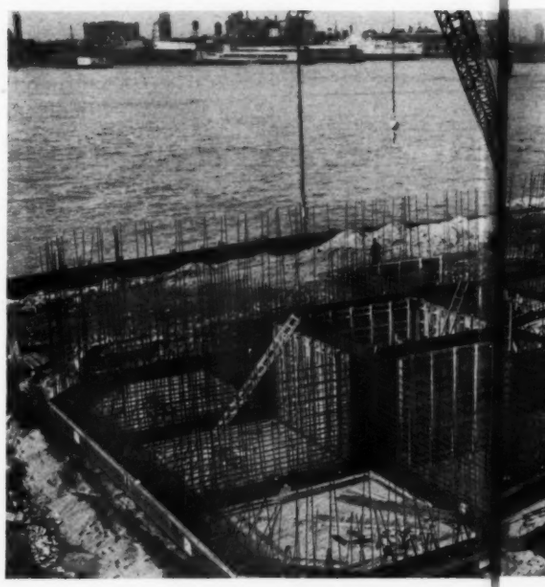
Caissons for Piers Are Sunh

Tower piers for new Delaware River suspension span will be supported on open-dredged concrete structures



Workmen erect the cutting edge and forms for concrete caisson being built for the Delaware River suspension bridge near South Philadelphia, Pa. The caisson will support the tower pier on the New Jersey side of the river. *C&E Staff Photos*

As Manitowoc cranes with 1½-yard clamshells remove underlying materials through wells in the caisson, the concrete structure begins to sink of its own weight. Dredging is done evenly throughout the caisson so that the structure will not tilt.

A full clamshell is hoisted through the caisson as another clamshell prepares to take a bite. Equal amounts of material are dredged from each well in a prearranged pattern. Excavated material is dumped into trucks and hauled away.

REINFORCED - CONCRETE open-dredged caissons which will support the towers of the new Delaware River suspension bridge at South Philadelphia are being sunk through sand islands built up just off each river bank by the contractor.

Fehlhaber Construction Co., Inc., New York, N. Y., has the $3,200,000 contract for the two tower piers. The work is being done for the Delaware River Port Authority.

The Delaware River Bridge will be a 7-lane high-level suspension bridge with a main span of about 2,000 feet, connecting South Philadelphia with Gloucester City, N. J.

A vertical clearance of 150 feet will be provided at mean high water.

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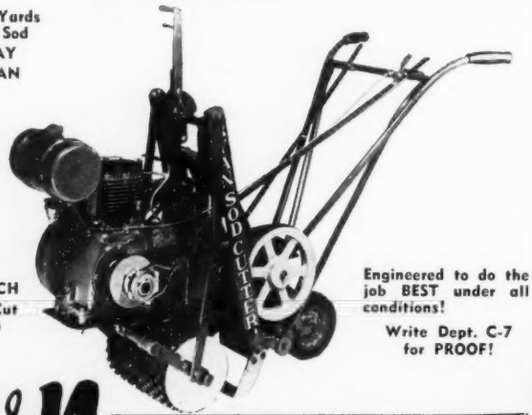

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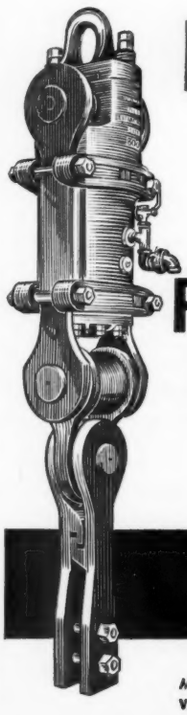

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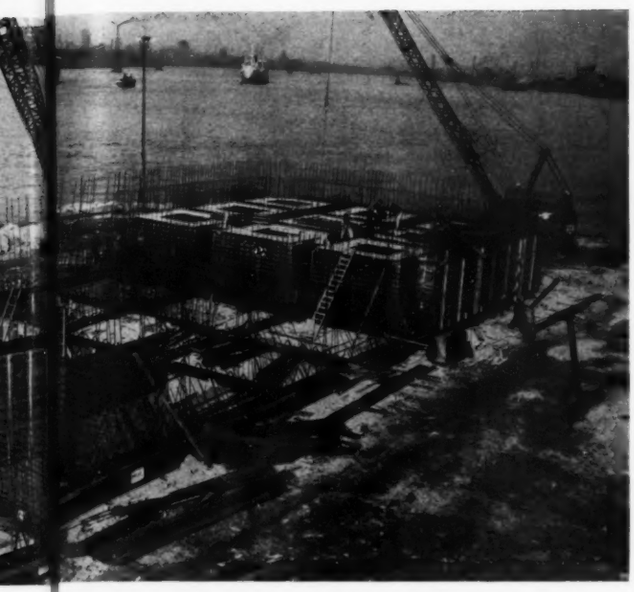

Suspended side spans of 770 feet will extend to the anchorages, now under construction by Merritt-Chapman & Scott Corp., New York, N. Y., under a $3,400,000 contract. The 79-foot roadway will be flanked by 3-foot walkways on either side.

Caissons

Fehlhaber began the caisson work on the New Jersey side of the river last October. A dredge was first brought in to remove a 40-foot-thick mat of silt and mud in a 300-foot-square area near the river bank. Clean sand was then pumped into the hole to build a sand island. Because the island was near the bank, only a single line of timber sheeting was required to contain the sand. On the Pennsylvania side, where the island is about 500 feet from shore, an arc-shaped cellular cofferdam of steel sheeting was required.

Sand islands, used with deep bridge caissons to provide a sound working space above the river, also hold the caisson in place until it is locked in stable subsurface material.

Identical Caissons

Except for depth, the two caissons are identical. They are 174 feet long, 64 feet wide, and are honeycombed with 27 cylindrical wells, each of which is 15 feet 4 inches in diameter.

(Continued on next page)

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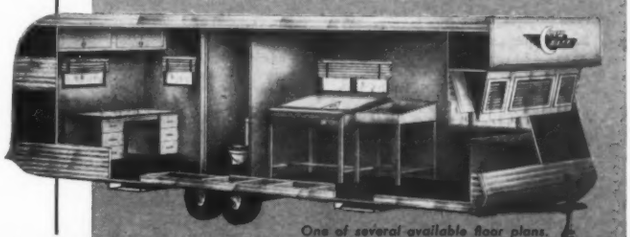

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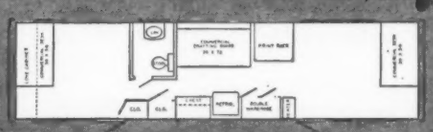

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Let us know your problem and we'll be glad to discuss it with you. Call or write:

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The New Jersey caisson will be 85 feet deep, and the Pennsylvania caisson, 105 feet. Wells are laid out in three lines and are separated by 4-foot-thick walls. The outer wall is 5 feet thick.

Cutting Edge

When the sand islands were leveled, the 3½-foot-high steel cutting edge was assembled in a checkerboard pattern on the sand surface. It was made mostly of welded ½-inch plate. Steel straps extended above the edge to anchor into the concrete walls.

The wells in the 13-foot-high base are square-shaped to conform to the cutting edge. When the caisson is finally sunk to the proper depth, tremie concrete will be placed in the base so that it rises two feet into the circular wells.

Forms

Designing forms for the honeycombed caisson posed several problems for the contractor.

To get the maximum number of re-uses, he decided to use Atlas sectional-steel forms made by Irvington Form & Tank Corp. These forms come in 8-inch widths and a variety of lengths that can easily be assembled and reassembled into a number of different panel sizes.

Fehlhaber decided that cantilever form panels made of eight sectional-steel units would be used to pour the 4-foot 9-inch monolithic lifts above the base. But before he had the cantilever panels assembled, he used the sectional-steel units to make exterior wall panels for the base pours. Because only one-third of the 13-foot-high base lift was poured at a time, there was no shortage of units.

All exterior walls on the base lift were formed with wood panels composed of ¾-inch plywood facing, 2 x 6 horizontal studs 16 inches on center, and double 2 x 6 vertical wales. Panels were tied together with five rows of Superior ½-inch coil ties. Each panel was used three times on each of the two caissons.

When the base lift with its rectangular wells was completed, the sectional-steel wall forms were modified into cantilever panels.

Anchor bolts 1¼ inches in diameter and 22 inches long held the cantilever panels against the lower lift. The bolt holes in the concrete were made with 1¼-inch template bolts, 24 inches long, supported rigidly during the pour by a wire holder and wedge device welded to a horizontal steel angle.

The circular wells were formed with one-piece collapsible steel plates 3/16-inch thick. These plate forms were supported on seat angles anchored to the base lift with ¾-inch bolts screwed into embedded coil loops.

Another forming problem came with the transition from a square to a circular well on the second lift. To support the bottom of the circular sections at the corners, panels were set on a 4 x 6 seat. These were anchored to the base with ¾-inch bolts which were screwed into 6-inch coil loops in the concrete.

Sounding wells, 8 inches in diameter and about 6 feet apart, are provided in all interior and exterior walls. These wells are formed with fiber Sonovoids.

Conventional concrete placing methods are being followed. Ready-mix trucks dump directly into Gar-Bro buckets, which are then swung over the forms by cranes. Concrete is consolidated with four Homelite vibrators. Three cranes place a lift of 1,100 cubic yards in about nine hours.

The day following the pour, workmen begin stripping the steel forms. After two or three days, the caisson is clear of forms, and the open dredging begins.

Dredging

The huge concrete caisson sinks from its own weight as two Manitowoc 1½-yard clamshells remove the underlying materials through the wells. Dredging is watched closely to make sure that the caisson does not tilt as it sinks.

Generally, the center line of wells is started first to balance the stresses. From five to ten buckets of material are removed from each well and dumped into trucks. After this, excavation moves to the outer ring. This back and forth movement is continued until the required settlement is achieved. The dredging pattern is directed by a spotter who keeps a record of the number of

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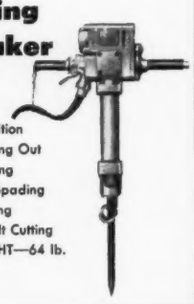

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HIGH CYCLE electric motors, powered by Homelite's dual purpose generator, will give you greater flexibility and thousands of hours of heavy-duty service. Ask for an on-the-job demonstration or for more information. Write Homelite Corporation, Port Chester, New York.

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Measuring the depth of excavation, a workman drops a sounding line through an 8-inch well formed by Sonovoids. The reading is then printed on the well map.
C&E Staff Photo

buckets of material removed from each well.

The complete dredging operation requires a total crew of only eight: a foreman, a spotter, two bucket signalmen, two truck signalmen, and two soundmen. The depth of the dredging is determined from time to time by dropping a lead line down the sounding wells.

The speed at which the caisson sinks varies according to the type of subsurface material encountered. In the 45-foot-thick sand island, it takes about three days to sink each 5-foot lift. Once the big unit reaches undisturbed riverbed material, its movement slows considerably.

Jetting

Two or three lifts will probably be required before each dredging to add extra weight. If conditions require, the contractor will use the system of 1-inch water jets imbedded every 12 feet in the outer wall. The jets are connected to a 6-inch header pipe carried up through each lift. They are angled upward to provide lubrication between the concrete and the encasing material.

Caissons are now being sunk on both sides of the river, with the one in New Jersey nearer completion than the other. The caisson on the New Jersey side will require 22,500 cubic yards of concrete, and the one on the Pennsylvania side will require over 29,000 cubic yards. The contract will be completed by the end of this year, and the bridge is scheduled to open early in 1957.

Personnel

C. Rauterkus is superintendent, H. Dietrick is assistant superintendent, and Charles Kinsing is job engineer for Fehlhaber Co. THE END

THIS NEW HEAVY-DUTY BACKHOE made by the Ottawa Steel Products, Inc., Ottawa 60, Kans., is shown supporting the weight of the 12,000-pound Allis-Chalmers Model HD-5 tractor on which it is mounted. The backhoe has an extended reach of 15 feet and will dig to depths of over nine feet. For further information write to the company, or use the Request Card at page 18. Circle No. 810.

Now you can accurately, easily flame cut all kinds of shapes — circles, angles, bevels, straight lines. NEECO cutting guides convert ordinary hand torches into precision cutting instruments. Attached quickly — without tools. Neat, clean cuts need little or no grinding or machine finishing. Models to fit all torches, from 70° to 90° types. Cut circles from 1 to 66 inches diameter. Every shop should have these new guides — as basic, time saving tools or as standby equipment.

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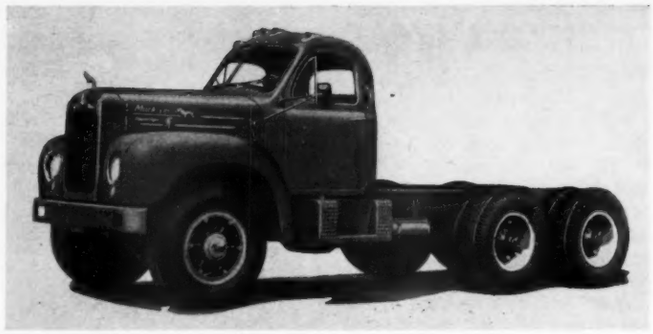
New Truck-Tractors Are Heavy-Duty Models

■ Four new truck-tractors reported to have a high power-to-weight ratio are announced by Mack Trucks, Inc., 350 Fifth Ave., New York 1, N. Y. Designated as Models B-70T, B-70ST, B-71T, B-71ST, the tractors are four and six-wheelers and are available with gasoline and diesel power. Four-wheel models are rated from 50,000 gcw to 63,000 gcw, depending upon trailer axle combinations, while the six-wheel versions carry a 76,800 gcw rating.

Mack's largest Thermodyne gasoline engine, the EN707B, a 707-cubic-inch unit that delivers 206 hp at a moderate 2,100 rpm, powers the B-70T and B-70ST. The B-71 Series tractors have a 743-cubic-inch diesel engine delivering 200 hp at 2,100 rpm. A wide range of transmissions offered includes both five-speed and ten-speed two-lever duplex types. An additional option of a three-speed auxiliary is available in combination with a five-speed main box for the six-wheel tractors only. All models feature the company's Vibrasorb clutch which protects driving parts from vibration.



The Mack Model B-70ST, one of four new heavy-duty truck tractors.

The tractors have wide-tread front axles and dual-reduction rear axles. Six-wheel models feature the Mack Balanced Bogie with its inter-axle Power Divider, which distributes power between the two axles in direct proportion to tractive requirements.

For further information write to the company, or use the Request Card at page 18. Circle No. 702.

Pennsylvania Crusher Move

The Pennsylvania Crusher Co., which has had offices in Philadelphia, Pa., for the past 50 years, has moved to West Chester, Pa. The company's test crush laboratory, with its full line of crushers and screen-analysis equipment, is also being moved from Norristown, Pa., to the new quarters.

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That's one reason why the Ætna Casualty and Surety Company is especially proud of the reputation it enjoys with contractors everywhere.

No matter where you are, no matter what the size of your project, the Ætna is in a position to render you prompt, efficient, helpful service.

The next time *you* need a bond, why not join the many hundreds of leading contractors who bond with Ætna — always.

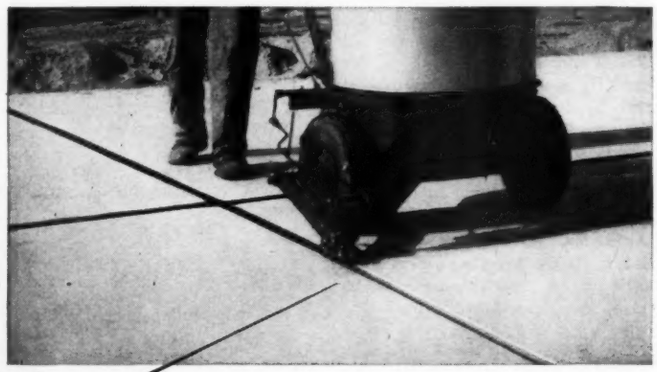
No job too big—no job too small

ÆTNA CASUALTY AND SURETY COMPANY

AFFILIATED COMPANIES: ÆTNA LIFE INSURANCE COMPANY

AUTOMOBILE INSURANCE COMPANY • STANDARD FIRE INSURANCE COMPANY

HARTFORD 15, CONNECTICUT



Economy points to *Flintseal* joints!

One application of dependable, durable FLINTSEAL* is just what your joints in concrete pavements need . . . for *years* and *years* and *years!*

That's *real* service . . . *real* economy!

This rubber-asphalt, hot-poured compound, unlike old types of bituminous fillers, won't crack or fail in cold. Won't flow and smear in heat. It remains extensible and compressible through expansion and contraction of the pavement slabs.

Does FLINTSEAL seal out water? *Positively!*

Yet it stays flexible and resilient, too . . . bonds to joint walls perfectly.

To seal joints in critical areas on airfields . . . be sure to specify FLINTSEAL JFR (jet fuel resistant).

Both FLINTSEAL and FLINTSEAL JFR meet State and Federal specifications.

★ Ask for complete technical information. Write today.

*Reg. U. S. Pat. Off.

Over 50 Years Specialized Experience At Your Service . . . by 'phone, mail or personal call. No obligation.

FLINTKOTE

THE FLINTKOTE COMPANY, Industrial Products Division, 30 Rockefeller Plaza, New York 20, N. Y. 55th & Alameda Sts., Los Angeles 54, Calif.

Flintkote Co. of Canada, Ltd.—Toronto, Ontario

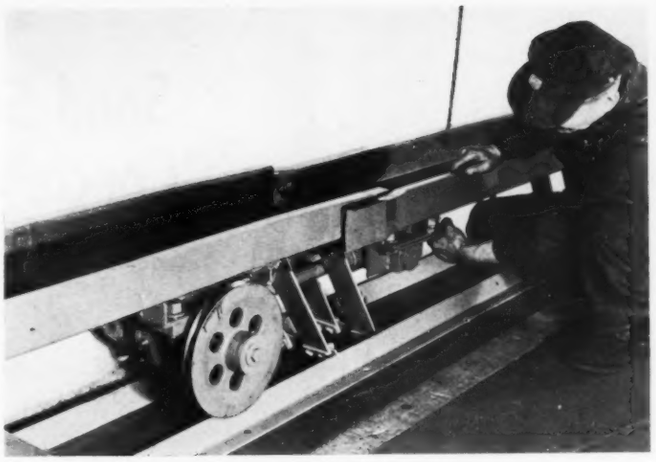
Vibrating Conveyor

■ A new and smaller vibrating conveyor has been developed by Hewitt-Robins, Inc., 666 Glenbrook Road, Stamford, Conn. The unit, mounted on springs, is designed to convey a variety of materials, including sand and gravel, at a speed of 38 feet per minute. Pans with a special coating or pans of stainless steel are available to make the conveyor suitable for handling corrosive and abrasive materials.

Standard pans are 4 inches deep and can be supplied in widths of 8, 12, or 18 inches, with or without top covers. The single-drive, 1-hp model is available in lengths ranging from 20 to 100 feet. Transfer sections can be used to couple two or more units in tandem. Extension sections, complete with springs and hardware, are available.

The new conveyor can be set up or moved in less than an hour, according to the manufacturer. The only maintenance required is the lubrication of three standard cartridge-type bearings.

For further information write to the company, or use the Request Card at page 18. Circle No. 806.



◄ This is the drive section of a new and smaller Hewitt-Robins conveyor.

Expansion Fasteners Fix Objects to Masonry

■ A fastener that is used to secure objects to concrete blocks, masonry, metal, pressed fiberboard, and many other construction materials is described in literature from the Star Expansion Products Co., Inc., 147 Cedar St., New York 6, N. Y. The Neo-Grip blind-expansion-type fastener is tightened with a special tool to exert a gripping force without shattering the material.

The literature lists fasteners with over-all lengths of 7/16 and 1/2 inch and with outside diameters of 1/2 and 9/16 inch. They are offered 100 to a box, and the special tool is included.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 712.

Higher Power Ratings For Diesel Engines

■ Changes in design have increased the output of General Motors' single 6-110 diesel engines to 300 hp maximum and 230 hp continuous. Maximum engine speed has been increased from 1,800 to 2,000 rpm. The continuous operating speed is now 1,800 instead of 1,600 rpm. The increases, totaling 25 and 17 hp, respectively, provide extra power useful for heavy-duty hauling vehicles, shovels, cranes, and other equipment subject to sudden load increases.

Freer engine breathing has been achieved by increasing the number of ports in the cylinder liners and by grouping the ports together in partially overlapping pairs to form larger figure-8-shaped openings. Other changes include a high-valve injector, new roller-bearing idler gear mountings, and larger piston struts. An SAE No. 1 flywheel housing size is also being offered which permits the use of additional standard transmissions without an adapter ring.

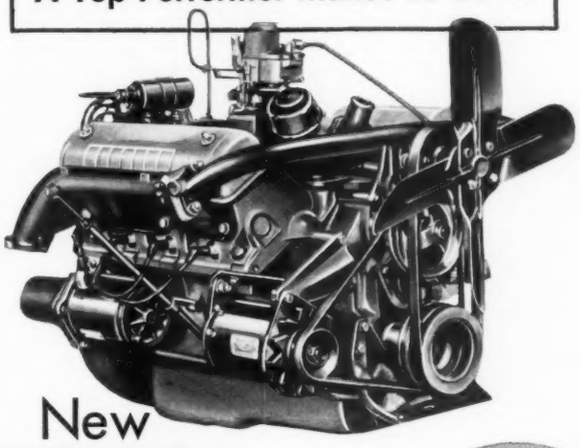
For further information write to Detroit Diesel Engine Div., General Motors Corp., 13400 West Outer Drive, Detroit 28, Michigan, or use the Request Card at page 18. Circle No. 738.

International Harvester Names Sales Supervisor

The new general supervisor of used-truck merchandising for International Harvester Co., Chicago, Ill., is V. I. Pearson. He has been with the company since 1939, working in motor truck sales in Boston, St. Louis, and New York.

Three of the company's regional sales managers have been reassigned. B. M. Kaiser has been transferred to the southern region; R. G. Greer, to the eastern region; and J. F. Adams, to the east central region. Previously, they worked in the eastern, east central, and southern regions, respectively.

A Top Performer makes its Bow!



New FORD "239" CU. IN. V-TYPE, O. H. V. 8-CYLINDER INDUSTRIAL ENGINE

THESE MODERN-DESIGN FEATURES SPELL EXCEPTIONAL EFFICIENCY!

Providing More Economical Power for Countless Commercial needs

HERE'S IMPORTANT NEWS for manufacturers of powered equipment and for the actual operators of their products as well: Ford presents a brand new "239" Heavy Duty Industrial Engine of the latest Overhead-Valve Type, designed to out-perform, with gas-saving economy, other internal combustion power plants of comparable displacement on the market today.

Actual operating tests have demonstrated that this engine delivers *more* usable power on *less* gas, because Ford engineers have cut horsepower waste formerly lost to internal friction. And its many new modern design features contribute to more dependable operation and greatly increased life.

Structurally and mechanically, the Ford "239" incorporates the latest advancements in engine design. Take time right now to glance through a few of the many important details of this engine's design checked in column at right. And remember, we'll welcome your inquiry as to the application of this power plant to your equipment. Phone or write to:

INDUSTRIAL ENGINE DEPARTMENT
FORD MOTOR COMPANY
15050 Woodward Avenue, Highland Park 3, Michigan

A special 8-page folder fully describing this new Ford "239" Engine includes complete specifications, power curves, detailed dimensional drawings, available accessories, etc. Send for it today.

- **Gas Saving High-Compression**—High compression (7.2 to 1) delivers maximum power from every drop of regular gas.
- **New Short-Stroke Power**—Large bore and short piston stroke provide more usable power with less frictional losses, and slower piston speeds with less engine wear for longer life.
- **Overhead-Valve Design**—Design of valves and combustion chambers contribute to efficiency by more complete use of fuel.
- **Free-Turn Valves**—Free-turn intake and exhaust valves, with integral valve guides, cast as part of cylinder heads, are far superior to the usual valve guide inserts. Valve life is increased up to 50 per cent.
- **Full-Flow Oil Filter**—Cleans *all* the oil before it reaches bearing surfaces, reduces cylinder wall, piston ring and bearing wear; prolongs engine life.
- **Rigid Block and Crankshaft Design**—Provides greater rigidity to withstand the toughest kind of operation.
- **Precision-Built Throughout**—Using the best materials for every component part and the most advanced techniques of manufacturing, this engine is exceptionally durable to withstand hard, heavy-duty usage.

YOUR JOB IS WELL-POWERED WHEN IT'S FORD-POWERED!

Available as Closed Power Unit

Ford INDUSTRIAL ENGINES AND POWER UNITS

Sand Subbase Carries Concrete Expressways

Material excavated in sections where the expressway will be depressed below ground level is hauled to outlying areas. Here a GMC 620 diesel truck with 15-cubic-yard Winch-Lift trailer is loaded by a Koehring 605 crane with 1¾-yard Page dragline bucket.

C&E Staff Photos

While most of the excavation work on the expressways calls for big machines, there are occasional jobs for smaller units like this Le Roi Tractair equipped with Henry hydraulic backhoe. The machine excavates a storm sewer trench.

Many contracts cover grading, paving, and construction of bridges on two major superhighways through Detroit

THE BUSTLING CITY of Detroit knows the distress as well as the pride of being the automobile capital of the world. A city that produces so many cars is bound to have a good-sized traffic problem. To relieve the situation the municipality, in cooperation with Wayne County and the Michigan State Highway Department, has undertaken the construction of two major expressways through the heart of the city.

Joining the Detroit Industrial Expressway at Michigan and Wyoming Avenues, the Edsel Ford Expressway slices northeasterly across the city. On the east side, the John C. Lodge Expressway starts at the Civic Center and runs northwesterly to connect with the James Couzens Highway. Portions of both expressways have been completed and are already in use, and additional sections are now under contract. By the end of 1957, both routes are expected to be completely open to traffic.

A large number of contracts have been or will be included in the combined project, which is estimated to cost a total of $170,000,000. Each street, railroad, and pedestrian overpass is a separate contract. Grading and paving projects are broken down into relatively short stretches to keep costs within the bidding ability of local contractors and to get the work done as quickly as possible. Costs for the first five miles completed averaged about $8,000,000 per mile.

A typical grading contract covered a project approximately a mile in length on the John C. Lodge Expressway between Lafayette Avenue and Grand River Avenue. Sugden & Sivier, Inc., Oak Park, Mich., was the contractor. Julius Porath & Son Co., Detroit, did the paving. Grading and paving on a stretch of about five blocks at the northerly end of this project was begun June 1, 1953, and completed by the end of the 1953 paving season. Excavation elsewhere along this project continued through the winter, and the job was completed early this summer.

Highway Depressed

Through this area, the expressway is depressed below normal ground level to facilitate overhead passage of intersecting streets. The normal section consists of six 12-foot lanes, three in each direction, with a separating median. Entrance and

2 Way INTER-COM PHONE OUTFIT

INCLUDED 2 BATTERIES 2 WALL CLIPS

INCLUDING 500 FEET "WEATHERPROOF" DOUBLE WIRE

$9.95 POSTPAID

SPECIAL INTRODUCTORY OFFER LIMITED

EXTRA WIRE AVAILABLE for operation up to 1 mile (Same wire as above) $3.95 postpaid 500 ft. carton

SAVES TIME AND STEPS

1 MILE TO TOWN

BUILT-IN SIGNAL BUZZER

You get complete outfit, ready to use . . . nothing else to buy. Guaranteed to give perfect tonal quality up to a distance of 1 mile. Talk and listen at the same time. Has built-in buzzer powered by flashlight battery which fits in handle. Costs nothing to operate. Phones are 8" high. Very rugged. Practically unbreakable. 500 ft. of weatherproof double wire batteries, and wall clips come with set. Use indoors or outdoors. Enjoy the convenience of two-way communication now at the unusually low price of $9.95 Postpaid. *Dealer Inquiries Invited.*

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P.O. Box 238, Schiller Park, Ill.

Gentlemen: Kindly send ____ two way Phone Sets, as described above, ready to operate. I enclose $9.95 postpaid.

Money Order or check for $ ____ is enclosed.

Name ____

Address ____

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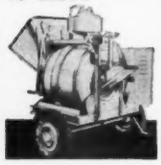
Satisfaction guar., or money back. Offer good in U.S.A. only.

CMC JOB MIXERS WILL POUR CONCRETE FASTER— SAVE MEN AND MONEY

They are built to take it . . . Compact . . Easy to Spot . . Easy to move



3½S NON-TILT

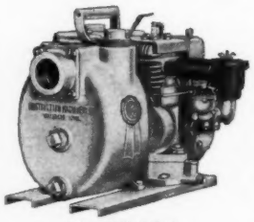
3½S TILTER

CMC Job Mixers are the biggest money makers in the mixer field. They are the easiest handled on the job and are perfectly balanced for high speed trailing.

If you want the best with the longest trouble-free performance choose CMC Job Mixers.

3½ to 16 cubic foot models are available to fit any job condition.

CMC DUAL PRIME PUMPS ARE LIGHTER WEIGHT YET LONGER LIVED

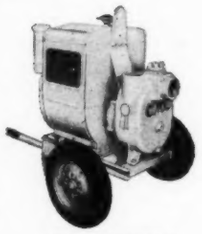


4M — 4000 G.P.H.

New dual volute design makes priming rapid, automatic and dependable. Unipacked shaft seal is protected by rapidly spinning liquid screen. Fewer parts — easier to service.

ALL SIZES

Built in all pipe sizes 1½" through 4". Other CMC Dual Primers in 6", 8" and 10" sizes with capacities to 240,000 G.P.H. Larger pumps have water cooled engines — gasoline or diesel. Also full line of electric pumps and pumps for belt drive.



40M — 40,000 G.P.H.

SOLD & SERVICED BY AMERICA'S BEST DISTRIBUTORS

CONSTRUCTION MACHINERY COMPANIES . . . . . WATERLOO, IOWA

Sand base material is delivered by a 10-yard tandem-axle Mack truck on a section of the expressway. A Caterpillar tractor with dozer stockpiles the material.

exit ramps are located at approximately half-mile intervals and are usually 16 feet wide for one-way traffic. Cross streets are carried over the expressway about every five blocks, and between these bridges there is usually a pedestrian overpass.

Where side slopes were 1½ to 1 or flatter, they were seeded and mulched under the grading and paving contracts. A complete landscaping program will be carried out later under a separate contract. Existing streets paralleling the expressway will become one-way service drives at the top of the side slopes on each side. Most of these drives will be paved 36 feet wide and will have a 9-inch barrier curb along the highway side. Average width of right-of-way will be 350 feet.

Traffic lanes are paved with 10 inches of reinforced concrete pavement resting on a 15-inch sand subbase. Ramps, merging lanes, and other adjuncts have a 9-inch reinforced-concrete base with an asphaltic-concrete mat of 220 pounds per square yard.

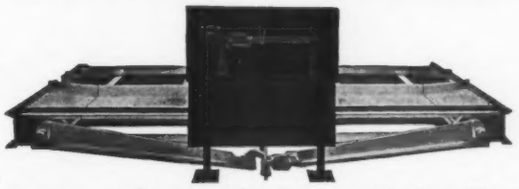
Excavation by Dragline

Sugden & Sivier's contract called for the excavation of 350,000 cubic yards of earth and the placing of 55,000 cubic yards of sand subbase. Excavation at the site of each bridge was included in a separate bridge contract, but the 15-inch subbase was placed through the entire length of the project. A Koehring 605 dragline with a Page 1¾-yard bucket did most of the excavating.

Excavated material was hauled 16 miles by a fleet of ten GMC tandem-axle diesel trucks pulling Winch-Lift trailers, plus hired trucks as needed. The big semitrailers hauled 16-yard loads of the silt and clay soils from the excavation to an area in nearby Dearborn which was being graded for a school playground.

(Continued on next page)

WINSLOW—PORTABLE TRUCK SCALE
"THE CONTRACTORS' SPECIAL SCALE"



For use at temporary and permanent locations—at stock piles and by bituminous material contractors at the job site. Capacities: 15-18-20-30 tons.

Write us for name of your nearest distributor.

WINSLOW SCALE COMPANY
P. O. Box 1198 Terre Haute, Indiana

let's look at WARCO from this angle

Mechanical steering, power-assisted by hydraulic booster, makes it easy for the operator to keep the blade where it's needed!

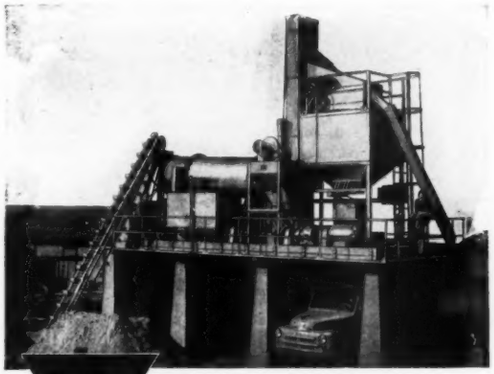
ONLY WITH A WARCO does the operator have such positive, effortless steering control, allowing him to concentrate on the work being done by the blade. No need to fight the wheel on a WARCO . . . lessened operator fatigue pays off in increased daily production.

ONLY WITH A WARCO does the operator have such complete control during any operation. Positive hydraulic controls hold the exact blade position without "drifting" . . . yet changes in blade angle or depth of cut may be made quickly and precisely from the cab, without interrupting or repeating the pass.

This WARCO hydraulic-booster steering assembly operates with fingertip control, yet gives the operator the "feel" of a manually steered grader.

W. A. RIDDELL CORPORATION
Bucyrus, Ohio U.S.A.
Builders of WARCO Motor Graders and HERCULES Road Rollers

WARCO® MOTOR GRADERS MODEL 4D-115 HEAVY DUTY 115 HP. MODEL 4D-85 MEDIUM DUTY 85 HP



WHITE ASPHALT PLANTS FOR HOT-MIX PAVING

These reasonably-priced stationary hot plants are complete on one steel frame, for easy moving to a new location. Excellent for medium-size city paving jobs; for street and highway maintenance; and for paving driveways, alleys, sidewalks or industrial plant areas.

Oil-fired rotary dryer, batch mixer, vibrating screen, divided hot bin, dust collector, volumetric or weigh scales, engine or electric power, air controls.

Model L-12, 12-15 tons per hour; Model L-25, 25-30 tons per hour. Portable units also available

For FREE circular, write—

Elkhart 9 White Mfg. Co. **Indiana**

(Continued from preceding page)

Nearby was a sand pit from which some of the trucks picked up return loads of sand for the subbase. A Northwest 41 dragline with a Page 1¼-yard bucket loaded the sand in the pit.

Much of the subbase material was stockpiled on the job and spread later. A Caterpillar D6 tractor and dozer helped stockpile the sand as it was received. When a section of the excavation was complete, a Tournapull C spread the sand cushion from the stockpiles. Some of the sand was also used for backfilling sewer and utility trenches. A Hough loader carried sand from stockpiles to the utility trenches scattered throughout the job.

Construction of the drainage system for the expressway and relocation of existing utilities were major operations in themselves. All storm and sanitary sewers, water mains, gas lines, and other utilities which crossed the route of the new highway were rerouted to eliminate these crossings. Storm drainage systems were then installed along the service roads on both sides of the expressway to intercept all drainage from these roads and adjacent areas. Drainage of the depressed area was handled through a storm sewer system installed in the center median. At convenient locations, this drainage was pumped up into existing storm sewers.

After drainage structures are installed, the excavated earth is carefully replaced and thoroughly compacted with a Jackson electric vibrator. Power is supplied by a Jackson generator in the background.

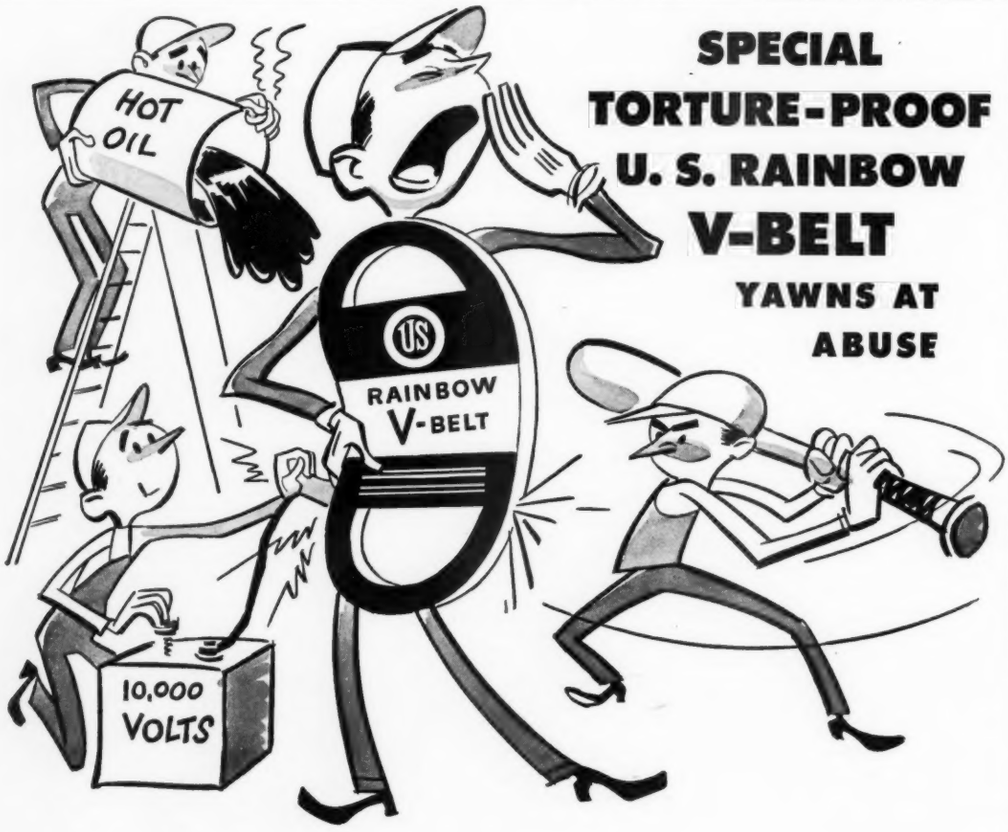
Trench excavation and pipe laying on this contract were handled by a Unit ¾-yard truck crane and a Northwest 25 backhoe. Some of the smaller trenches were dug by a Le Roi Tractair equipped with a Henry backhoe. When old building foundations or other obstacles stopped the backhoe, a Tractair supplied air for breaking tools used to cut away the obstacle. Another Le Roi Tractair was used almost continuously with breaking tools to cut through sidewalks, pavements, and old foundations.

Special care was taken in the backfilling of all trenches. Sugden & Sivier used four Jackson electric vibrators powered by three Jackson generators to compact trenches and areas around manholes and catch basins. If the material excavated from the trenches was not compactable, it was hauled away and sandy material brought in for the backfill. Layers of 6 to 10 inches, depending on the moisture content, were placed and compacted with the Jackson vibrators.

Many Bridges

Five bridges cross the John C. Lodge Expressway within the limits of this grading contract. One of the largest of these is the crossing for Grand River Avenue, which was built by L. A. Davidson, Lansing, Mich. Before this bridge could be started, a detour was constructed to handle the heavy traffic. The detour is a 6-lane concrete pavement about two blocks long which circles out around the bridge site.

An interesting structure is the bridge which carries West Grand Boulevard over the Edsel Ford Expressway. Basically, this is a double bridge to carry the separated roadways of Grand Boulevard across the expressway. Center off-ramps from the expressway complicate the structure, making it into a huge off-balance H. Ramps at the sides lead down to the lower road. At this point and at about two-mile intervals along the highway, special bus ramps are constructed. These permit express buses to pull out of

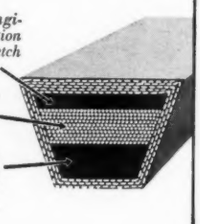


SPECIAL TORTURE-PROOF U. S. RAINBOW V-BELT YAWNS AT ABUSE

If your V-belts have to withstand conditions not found on the average drive, such as oil, high temperatures, static electricity—order U. S. Rainbow® V-belts compounded to handle such rugged treatment.

- Cords are treated with latex to reduce heat generated by constant flexing, and to get maximum adhesion between the component parts of the belt.
- Straight sidewalls provide extra pulling power by gripping the grooves for complete contact the full height of the belt.
- Protective jackets keep out dirt and prolong wear.

Order from your distributor, or contact any of United States Rubber Company's 26 District Sales Offices, or write to address below.



Top rubber cushion in closely engineered balance with the lower section . . . to keep cool under constant stretch and return.

Equa-Tensil Cord Section— all cords scientifically placed, each pulling its share of the load.

A sturdy level cushion for the Equa-Tensil Cord Section provides structural firmness for V-grooves and over the flat pulley of V-to-flat drives.

A COMPLETE DRIVE SERVICE

MULTIPLE V-BELTS • F. H. P. V-BELTS • SHEAVES
FLAT BELTS AND BELTING • SPECIAL PURPOSE BELTS

"U. S. Research perfects it.
"U. S." Production builds it.
U. S. Industry depends on it.

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Hose • Belting • Expansion Joints • Rubber-to-metal Products • Oil Field Specialties • Plastic Pipe and Fittings • Grinding Wheels • Packings • Tapes
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WYCO
2 H.P. UNIVERSAL ELECTRIC MOTOR
VIBRATOR
Place Concrete faster! Light - Powerful
WRITE FOR CATALOG WYCO GASOLINE AND ELECTRIC VIBRATORS
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traffic lanes to pick up and discharge passengers and then re-enter the expressway without conflicting with other traffic. The Grand Boulevard bridge was constructed by Darin & Armstrong, Inc., Detroit.

Most spectacular by far of the expressway projects is the interchange at the intersection of the two crosstown highways. When completed, this series of structures and roadways will permit vehicles to make any turning movement or proceed straight through without crossing any other traffic lane and without any cloverleaf loops. Part of the structure is being used to carry the traffic on the John C. Lodge Expressway while the remainder is under construction.

As each new section of expressway is completed, it is opened to traffic. By the end of the 1953 construction season, approximately six miles of the two highways were in use. The entire project is scheduled for completion in 1957. Based on observation of the use of those portions already opened to traffic, it appears that the expressways will be carrying their full traffic load by the time they are completed.

Personnel

Charles M. Ziegler is Michigan state highway commissioner; Harry C. Coons is deputy commissioner and chief engineer. With state, county, and city cooperating in the project, coordination of activities is especially important. The three men charged with this job are C. H. Brown, metropolitan engineer of the Michigan State Highway Department; Leroy Smith of Wayne County; and Glen Richards of the Detroit Department of Public Works. F. C. Skebensky is construction engineer on the Edsel Ford Expressway, and Mike Huber has the corresponding position for the John C. Lodge. Charles Buttermore was project superintendent for Sugden & Sivier, Inc., on the grading project.

THE END

National Implement Co. And Harris Consolidate

The National Implement Co., Inc., Stockton, Calif., and its agent, National Implement Co., 55 William St., New York, N. Y., have consolidated with the Harris Mfg. Co., 702 N. Wilson Way, Stockton, Calif.

The companies will continue to operate under the Harris Co., manufacturer of the Harris tractor. Charles Bishop, vice president of National and manager of the New York office for the past four years, will serve as eastern factory representative for Harris, managing all territory east of the Mississippi River. He will maintain headquarters in Princeton, N. J.

Block-Lifting Device

■ A device for handling cement block on construction sites is produced by the Waco Mfg. Co., Dept. KP, 3565 Wooddale Ave., Minneapolis 16, Minn. Made of lightweight magnesium alloy, the Waco Blocklift enables the mason to hold the block firmly with one hand and "butter" and line up the block with the other. Each mason's helper can easily carry two blocks per trip.

The unit is constructed in one piece, and the handle has a positive grip. The jaws of the device clamp tight on the block when raised. The units are also available in tandem form for faster production and lower handling costs on elevated jobs.

For further information write to the company, or use the Request Card at page 18. Circle No. 807.

◀ Workmen use the new Waco block-lifting tool to carry and hold cement blocks.

NEW—side-dumping SHOVELOADER cuts loading time up to 50%!

This new side-dumping SHOVELOADER offers definite advantages over straight front-end loaders on many applications:

1. **Loading time is cut as much as 50%. Trucks need not be backed into exact position—loader fills truck from rear or sides without turning.**
2. **It can operate in congested areas, where backing and turning for loading or stockpiling are not possible.**
3. **Clutch life is doubled. Two less clutching operations are required for the pick-up, discharge cycle.**
4. **Funnel-like discharge from end of bucket (see inset) means greater precision in load placement—eliminating spillage and clean-up work.**
5. **Snow removal and "windrow" operations are speeded and equipment life increased by straight line travel, front pick-up and side discharge.**
6. **Operates like conventional front-end loader when desired.**

Selection of side or front dumping is made from operator's position. Bucket tips to side by hydraulic action, and end plate starts to open immediately by lever linkage, with speed of opening increasing as angle of tilt increases. End closes automatically as bucket returns to horizontal position.

Side-dumping SHOVELOADER attachments are available in ¾ and 1¼ cu. yd. bucket sizes. Write for further information. BAKER-LULL Corporation, 370 West 90th Street, Minneapolis 20, Minnesota.

Baker Lull handling equipment

SHOVELOADER®

DRILLING CONTRACTORS

Diamond and Shot Core Borings, Dry Sample Borings, Grout Holes and Pressure Grouting, Foundation Testing for Bridges, Dams and all Heavy Structures

Manufacturers, also, of Diamond Core Drilling Machines and complete accessory equipment, including all types of Diamond Drilling Bits.

Write for Catalog No. 320

SPRAGUE & HENWOOD, INC.
Dept. C, Scranton 2, Pa.

Truck-Crane Features Smooth Hoist Control

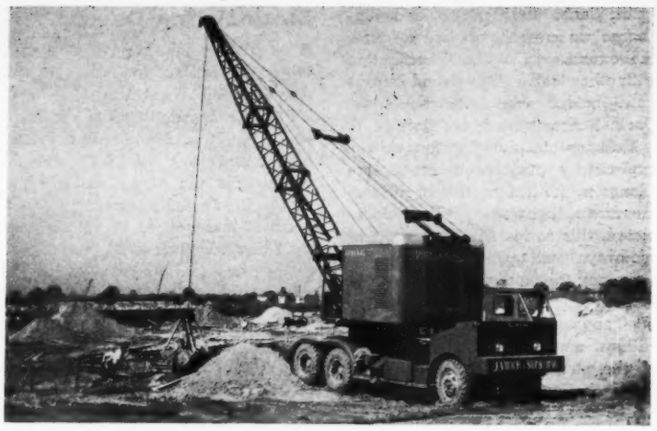
■ Details have been released on the 25-ton truck-crane recently announced by Osgood-General, P. O. Box 515, Marion, Ohio. The Model 322 excavator-crane can be converted in the field from one type of service to another. The rear bumper and outriggers are demountable.

The superstructure of the machine is secured to the chassis by a gudgeon, built into the truck frame and stabilized by four large-diameter adjustable hook-swing rollers. The engine and the deck machinery in the superstructure are at the rear of the deck to increase stability and lifting capacity without the use of a large amount of dead counterweight.

Manual control of disk-type clutches and wide outside-contracting band-type clutches facilitate the handling of heavy loads. An Osgood-General feature is the Easytouch disk-type Servo clutch which actuates the hoist clutch through a brake friction plate. This mechanism, available as standard equipment, results in smooth engagement of the hoist-clutch and positive control of the hoist drums.

A combination of the special clutch and an optional torque converter becomes a load-lowering device, making it possible to hold the load safely in mid-air or "inch" it up or down. The throttle, either hand or foot-operated, controls the input speed of the converter, matching its output power against the line pull. An independent boom hoist powers the boom up or down.

Other extras available are remote control of the chassis from the superstructure cab and a fluid coupling which smoothes the operation but does not multiply the torque.



The chassis has a 178-inch wheelbase, with a turning radius of 40 feet. The cab is of the offset one-man type. A choice of engines is offered for both chassis and superstructure.

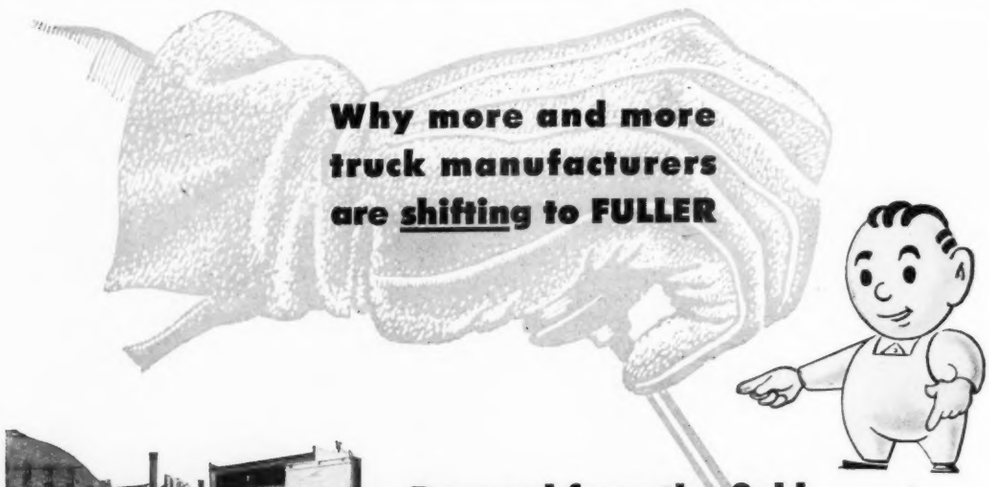
For further information write to the company, or use the Request Card at page 18. Circle No. 706.

Portable Batch Plant

■ A portable batch plant designed to bring the source of concrete close to the job is described in a bulletin issued by the Conveyor Co., 3260 E. Slauson Ave., Los Angeles 58, Calif. The feature of this plant is its portability and the speed with which it can be erected in one work shift.

The Conveyco 5½-yard batch plant is so designed as to permit addition of rescreening facilities when needed. Also illustrated are the portable bucket elevator unit for handling aggregates, and the portable recirculating bulk-cement silos for use with the batch plant. This company offers plants in capacities from 75 to 500 tons, and many of them are shown in this bulletin.

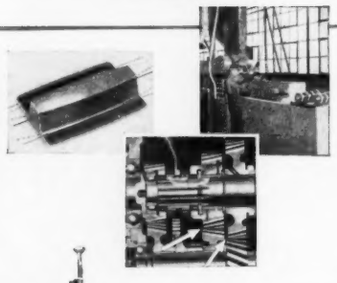
To obtain this literature write to the company, or use the Request Card that is bound in at page 18. Circle No. 747.



Why more and more truck manufacturers are shifting to FULLER

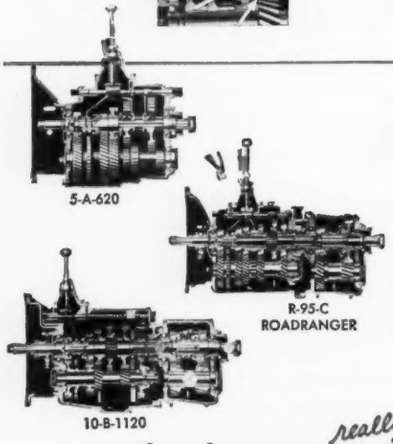
Demand from the field

Ask the driver—the man who has to maintain engine rpm to meet round-trip schedules. Ask the mechanic—the man who has to keep the truck *on the road*. Ask the owner—the man who has to pay the bill if the transmissions fail. They'll tell you they want a Fuller Transmission . . . *for Fuller has the features for more profitable trucking.*



Fuller design features

Open up a Fuller Transmission . . . and you can see the "extras" Fuller provides. Take a Fuller-equipped truck out on the road and *feel* it perform. Constant mesh, helical gears mean easier, faster shifting in forward speeds. Crowning the gear teeth prevents stress . . . longer life for Fullers. Shot peening reduces metal fatigue . . . less material failure.



110 Models—100 to 400 hp

Specify a Fuller Transmission for your on- or off-highway units and get a transmission *matched* to your load and road conditions . . . that will provide the right ratios for your job. Specify a transmission *designed to deliver* more effective horsepower . . . a Fuller Transmission.

where horsepower really goes to work

Fuller TRANSMISSIONS

FULLER MANUFACTURING COMPANY (Transmission Division), KALAMAZOO, MICHIGAN

Unit Drop Forge Division, Milwaukee 1, Wis. • Shuler Axle Co., Louisville, Ky. (Subsidiary) • Western District Branch (Sales & Service—All Products), 641 E. 10th St., Oakland 6, Cal.

•COMPRESSIBLE—NON-EXTRUDING

•95% RECOVERY AFTER COMPRESSION

Ideal for joint filling in flood walls, outlet works and spillways, sewage treatment plants, etc. Cork Joint Filler keeps joint filled at all times. Light color does not mar appearance of exposed concrete.

Write for details on Cork Joint Filler and the complete line of Servicised Asphalt, Cork and Rubber Composition Joint Fillers.

SERVICISED PRODUCTS CORP.
6051 W. 65TH ST. • CHICAGO 38, ILL.

New Insurance Service Clarifies Coverage

■ A new insurance service offered by Aetna Life Affiliated Companies, Hartford 15, Conn., provides the contractor with an analysis of his insurance needs or his coverage in the form of a handy ready-reference record. The Plandex visible record enables the contractor to see and understand his insurance program. It contains transparent vinyl pockets to hold his policies, and folds compactly when not in use. The analysis cards provide a ready-reference outline of the insurance but do not contain complete statements of coverage appearing in insurance policies.

This service helps to determine exact insurance requirements and to detect hidden hazards in the coverage. It instantly locates policies and shows how the insurance will perform when the contractor is faced with a loss.

For further information write to the company, or use the Request Card that is bound in at page 18. Circle No. 714.

Concrete Batchers Are Twin-Bin Units

■ A new series of batchers for concrete mixing offers units for jobs requiring up to 1,000-pound batches. The new B Series Twin Bins, made by Cimco, Box 422, Marshalltown, Iowa, are available mounted on wheels, as Model BW. The mounting makes it easier to move this heavier model to all jobs and is recommended for jobs calling for many separate pours.

The batchers are offered complete with a stock bin including a rear metal flap and sideboards, and a scale bin with a built-in 1,000-pound hopper scale. The scale is made by Fairbanks, Morse & Co. The batchers are designed with a low loading height so that they may be charged by a small loader or other inexpensive equipment.

A specification sheet, complete with on-the-job pictures, is available from the manufacturer.

For further information write to the company, or use the Request Card at page 18. Circle No. 752.

There is a GM Diesel Engine Distributor Near You

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ARMSTRONG EQUIPMENT CO.

ARIZONA—Phoenix
O'CONNELL BROTHERS, INC.

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Los Angeles 21
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THE COLORADO BUILDERS' SUPPLY CO. (Equip. Div.)

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MICHIGAN—Detroit 4, Grand Rapids
THE EARLE EQUIPMENT CO.
Iron River
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TAYLOR MACHINE WORKS

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WESTERN MACHINERY & ENGINE CO.

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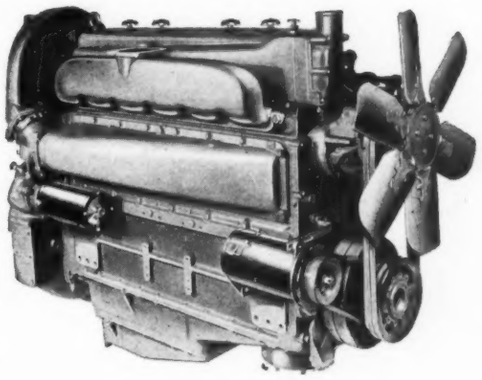
THE COLORADO BUILDERS' SUPPLY CO. (Equip. Div.)

NOW 300 HORSEPOWER



in GM "6-110" diesel engine

Improved Design Gives Still More Power Per Pound From Same Size Unit

Want more power—and production—from your heavy-duty equipment?

Stymied because you can't fit a higher-horsepower Diesel into your units?

Now you can get the power you need—and the increased production you want—with a new 300-horsepower General Motors "110" Diesel—the engine that delivers more torque in the working range. And, you can get them with no increase in engine size or weight.

Higher horsepower means faster operating speeds—high torque means more working power—for operators of all kinds of heavy-duty units.

In off-highway trucks this combination means better hill-climbing, more trips per day, bigger pay loads.

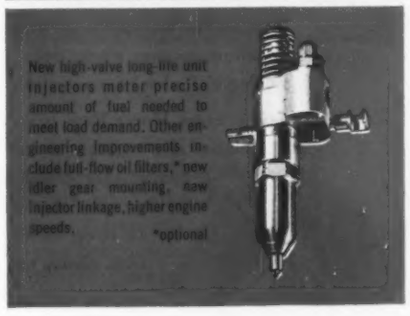
In shovels it means faster digging and loading, more yardage, lower maintenance costs.

In drilling rigs it means more hole per day, faster round trips.

In tractors it means more power for pulling, pushing or "dozing."

Get full details on the new, more powerful GM Series 110 Diesels from your GM Diesel distributor. Have him show you that GM Diesels cost less to buy, less to run and less to maintain than any other Diesel.

New "Figure 8" cylinder liner design gives freer "breathing," better fuel-air mixing for more complete combustion and higher engine efficiency.



New high-valve long-life unit injectors meter precise amount of fuel needed to meet load demand. Other engineering improvements include full-flow oil filters,* new idler gear mounting, new injector linkage, higher engine speeds. *optional

GM GENERAL MOTORS DIESEL POWER

DETROIT DIESEL
ENGINE DIVISION
GENERAL MOTORS • DETROIT 28, MICHIGAN
Single Engines . . . 16 to 300 H.P. Multiple Units . . . Up to 864 H.P.

Front-End Loader for Wheel Tractor

■ A new hydraulic loader for the Fordson Major diesel tractor has been placed on the market by The Johnson Hydraulic Equipment Co., 515 W. 78th St., Minneapolis 23, Minn. The Work Horse Model 1080 is reported to be of heavy-duty construction and has a center of gravity kept low and to the rear for stability and traction.

Available attachments include a 4-foot material bucket, a 6-foot bulk material bucket, a dozer blade, and an 8-foot boom.

Double-acting cylinders control the bucket hydraulically. The loader is equipped with a heavy ⅝-cubic-yard heaped-capacity bucket. It has a 3,500-pound breakaway capacity and a 2,000-pound maximum lift to a height of 10 feet 6 inches. Dumping clearance is 9 feet.

No part of the loader is higher than the tractor or operator, thus allowing for operation in confined areas. Most canvas windbreakers can be installed without alteration. A front-end guard, which is an integral part of the loader, protects the tractor grill and radiator from damage.

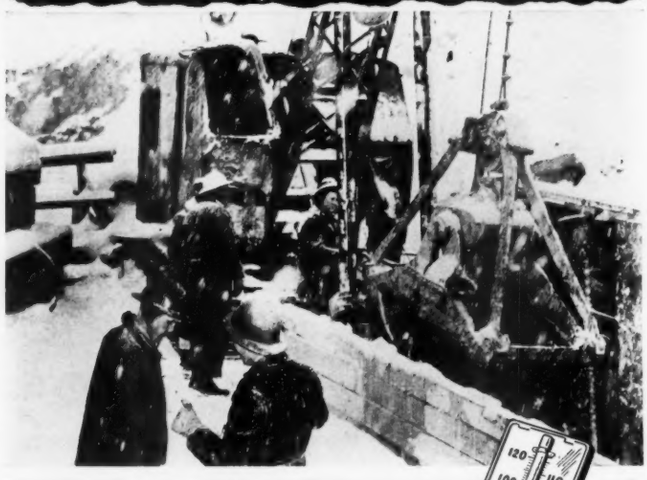
For further information write to the company, or use the Request Card that is bound in at page 18. Circle No. 691.

Air Entrainment Tests

A reprint of an article on experimental air-entrained concrete which appeared in Bulletin 70 of the Highway Research Board is being made available by the Portland Cement Association, 33 W. Grand Ave., Chicago, Ill. The article was written by L. E. Andrews, regional highway engineer with the Portland Cement Association.

Entitled "Record of Experimental Air-Entrained Concrete 10 to 14 Years After Construction", the booklet describes the performance record of 14 concrete test roads in five northeastern states. The sections of air-entrained concrete paving are compared with adjacent sections which did not have air entrainment. Tables and photographs are included.

Frosty OWEN



at HUNGRY HORSE DAM

In a majority of "run-of-the-mine" jobs and most of the exceptionally noteworthy projects you'll find Owen Buckets handling important digging and material handling operations.

That is true whether it is a bridge abutment, a dam foundation, caisson work, deep trenching, aggregate handling or "what have you."

The Hungry Horse Dam is an example. Thirty degrees below zero weather didn't stop operations or hinder this Owen Bucket in performing the desired service required in deep down digging of frozen clay, shale, etc.

You, too, can depend on Owen.

A MOUTHFUL AT EVERY BITE

THE OWEN BUCKET CO.

6030 Breakwater Ave., Cleveland 2, Ohio

BRANCHES: NEW YORK, PHILADELPHIA, CHICAGO, KENNEDY, CALIFORNIA, FT. LAUDERDALE, FLORIDA

VERTICAL PRESTRESSING OF CONCRETE walls for a concrete water tank is done with a Re-Mo-Trol hydraulic jack. Six wires, which are secured in the bottom of the wall, are prestressed at one time.

Remote-Controlled Hydraulic Puller Perfected for Prestressing Concrete

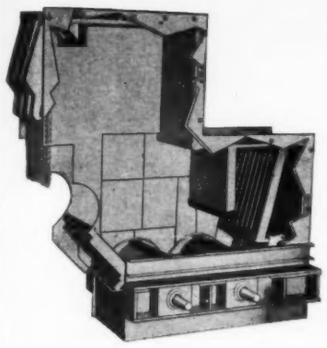
Construction Men Cite Simplex Unit for Fast, Easy Use

Tensioning cable, wires or rods for concrete prestressing is being done easily and quickly with Simplex hydraulic "center-hole" pullers, a number of construction men report. Because the unit is actually made up of two parts, a remotely controlled ram and a pump, the puller is more easily handled than conventional hydraulic jacks, they explain. The pump unit can be located nearby where it is most convenient for the operator. Many users install a pressure gauge, available as an accessory, between the pump and the puller to check the amount of prestressing applied. This Simplex Re-Mo-Trol puller is also useful on construction jobs as a powerful jack for lifting equipment and building sections, for aligning heavy beams, etc., and for testing the load bearing ability of the soil. Available in 7 models with capacities from 10 to 100 tons, it works in tight spots and enables workmen to stay at a safe distance while lifting, pulling or pushing.

Made by the world's largest manufacturer of industrial jacks, the Re-Mo-Trol is only one of many Simplex jacks that are useful in the construction industry. Others include the famous Jenny self-contained "center-hole" puller, the No. 310A Emergency Jack which lifts 15 tons on the cap, on the toe, on a cap shoe or at intermediate heights with a chain sling, and standard hydraulic, screw and ratchet lowering jacks. They are all described in General Catalog No. 53. Write for a free copy.

TEMPLETON, KENLY & CO.
2511 Gardner Road • Broadview, Illinois

THE SIMPLEX RE-MO-TROL for prestressing concrete is basically a powerful pump connected to a remotely controlled "center-hole" hydraulic ram by a high pressure hose.



Cutaway view of the Kennedy Van Saun Model 3648 Cuber Senior impact breaker.

New Impact Breaker For Multistage Reduction Of Nonabrasive Stone

■ A machine featuring a new multistage reduction principle for impact breaking of stone and minerals has been introduced by the Kennedy-Van Saun Mfg. & Engineering Corp., Beaver St., Danville, Pa. The Kennedy Cuber Senior is a dual-rotor up-running impact breaker, featuring triple-action reduction principle for both primary and secondary breaking of nonabrasive stone in a single unit. It is designed for both stationary and portable use in open or closed-circuit operation.

Regulated material flow is achieved with a low-positioned feed device that provides a minimum feed height for maximum rock penetration. As the material enters the machine, and while it is still falling, it encounters the rigidly mounted hammers of the first rotor in a head-on impact. At this first point of concussion, the material is exploded along natural cleavage lines.

Two massive rotors with integral hammers provide the entire rock-breaking action, making it unnecessary to mount supplemental impact members close to the periphery of the hammers. The reduction chamber is large enough to permit free breaking of infed rock without restricting flow or jamming the breaking area.

With an adjustable rock-deflecting baffle and a provision for varying speeds, the machine produces a wide range of concrete and bituminous aggregate sizes with full gradation control. Profitable percentages of aglime can be produced simultaneously. The unit will handle any quarry rock freely passing the 36 x 48-inch feed opening. In many types of rock, it can be operated in a closed circuit to produce 100 per cent passing 1 inch.

Maximum capacities of the Model 3648 breaker in average limestone are listed as up to 350 tons per hour of minus 3 inch, up to 275 tons of minus 2 inch, and up to 150 tons of minus 1 inch. For this, 150 to 250 hp is required. The Cuber Senior is fabricated of steel plate with cast manganese-steel wear plates lining the interior of the reduction chamber.

For further information write to the company, or use the Request Card at page 18. Circle No. 687.

Self-Propelled Cranes

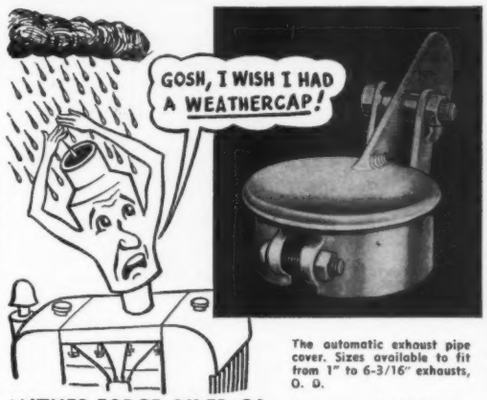
■ Lorain Moto-Cranes and self-propelled cranes in the 524 series are featured in a new catalog released by the Thew Shovel Co., 28th and Fulton Road, Lorain, Ohio. Detailed design and construction views, along with on-the-job photos, highlight the booklet.

A section is devoted to the hydraulic coupling power takeoff, which allows crane loads to be raised and lowered by throttle control. This is said to result in smoother hoisting, precision lowering, and glide swinging, all at variable speeds. It also acts as a shock-absorber when the machine is switched to shovel or hoe use.

Power-assist steering and equalizer rocker beams are other construction features. Antifriction bearings used on the hoist and swing drums are a feature also covered.

To obtain this literature write to the company, or use the Request Card that is bound in at page 18. Circle No. 808.

National Progress is the sum of individual industry, energy, and uprightness.—Samuel Smile.



The automatic exhaust pipe cover. Sizes available to fit from 1" to 6-3/16" exhausts, O. D.

WEATHERCAP provides positive year 'round protection for all engines with vertical exhaust pipes: compressors, road pavers, mixers, crushers, generators, etc. Fully automatic—opens and closes instantly by means of engine exhaust. Seals out rain, snow, dirt, insects . . . prevents flooded pistons, cracked cylinder heads, rusted or warped valves. Quality-built of heavy gauge steel with balanced fins made to uniform specifications conforming to engine exhaust pressures. Low in cost — years of service. Immediate delivery. Write today for full particulars and prices.

ANTHES FORCE OILER CO., AVE. M AT 20TH ST., FT. MADISON, IOWA

WHY NOT CHOOSE IT TO BEGIN WITH?

Do away with costly, early bucket replacement

Field reports indicate a great preference for Amsco manganese steel buckets over ordinary steel, for replacement on hard-working field equipment.

It is false economy to wait until replacement time to specify Amsco, when these sturdy manganese buckets are available on original equipment.

With your next new equipment order, specify durability and long life right on your purchase order . . . *specify Amsco manganese steel buckets.*

Brake Shoe

AMERICAN MANGANESE STEEL DIVISION
Chicago Heights, Ill.

Pre-Planned Methods Help Job Efficiency

By A Clever application of scientific management techniques, the H. K. Ferguson Co., Cleveland, Ohio, has developed some new ideas on how to run an efficient construction job. One of the country's top specialists in the field of "package" design and construction, Ferguson has launched a major program aimed at bringing construction in line with industrial production methods.

"Our chief interest at all times is sound economic design and fast construction," says a spokesman for Ferguson. And to maintain this policy, the company is borrowing all kinds of tricks from the plant engineers.

The firm is quick to assert, however, that the new program is not a speedup. By giving the worker the proper tools and materials, at the proper time, to do a definite preplanned job, work is actually made easier. The methods planning and scheduling system is set up so that all field managers from project manager down to foreman are required to make contributions. The result is less waste and confusion, better efficiency and economy, and even improved morale.

Basic Policy

Operating full-swing only a few years, the program is already accepted as basic Ferguson policy on every new job. It is carried out primarily by young imaginative engineers trained to keep an open mind, question every motion, study all possible alternatives, and generally apply the typical analytic approach of an industrial manager to construction.

There are many phases to the program, but most of the work falls under two headings—methods preplanning and manpower scheduling.

Pre-Planning

Basically, the pre-planning program is designed to simplify all operations, especially the unusual ones. By studying each problem for weeks ahead, the best method is determined, recorded step by step, and then passed on to the proper foreman in plenty of time for him to put it to use.

The pre-plan may vary from a simple one-line description to an elaborate form complete with working time estimates, condensations of specifications, and detailed drawings.

ANOTHER WAY YOU SAVE WITH FORD TRIPLE ECONOMY

T-Series Chassis-Cab models fit any special purpose body from 9 to 19 ft., give you up to 3,800 lbs. more payload than other make 6-wheelers.

New Ford Tandem-Axle Big Jobs

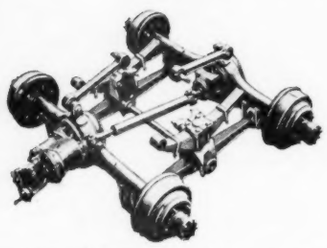
factory-built for low first-cost!

The new Ford T-700 and T-800 Big Jobs bring famous Ford performance and economy to the extra-heavy-duty field. Ford's mass-production methods keep quality high, first costs low. You get much larger body and payload capacities—up to 95% more on the T-800 than F-800—within legal axle weight limits of most states.

Three new engines up to 170 h.p.—Ford's new Low-Friction, overhead-valve V-8 engines give you low piston speeds, up to 50% longer engine life and more gas-saving power. All-new 138-h.p. *Power King* V-8 and 152-h.p. *Cargo King* V-8 for T-700, and 170-h.p. *Cargo King* V-8 for T-800, develop up to 44% more power per cubic inch than other engines in their class.

New *Master-Guide* Power Steering is standard on the T-800 and on the T-700 (with 152-h.p. engine). Operative at all times, it cuts steering effort as much as 75% and practically eliminates road shock to the steering wheel. New Ford *Driverized* Cab and controls provide comfort and driving ease to help the driver do hard jobs faster, with less effort.

For complete information, see your Ford Dealer, or write: Ford Division, Ford Motor Co., Dept. T-10, Box 658, Dearborn, Mich.



New Ford factory-installed tandem rear axles are the most modern in the industry. Rubber-bushed suspension reduces shock, minimizes lubrication needs. Power divider with 3rd differential equalizes driving power for longer tire life. Lockout feature standard.

SAVE WITH *ALL THREE*!

1. Gas-Saving Power! **2.** Driver-Saving Ease!
3. Money-Saving Capacities!
And . . . Ford Trucks last longer, too!

FORD *TRIPLE ECONOMY* **TRUCKS**
MORE TRUCK FOR YOUR MONEY!

FOUNDATION CONSTRUCTION
CAISSONS
SHAFTS
DRILLED AND UNDERREAMED
PIERS
SPECIAL DRILLING PROBLEMS
Wire or phone for a quotation on your next foundation job — *ANYWHERE IN THE WORLD*
McKINNEY DRILLING COMPANY
NACOGDOCHES, TEXAS
Phones: 1195-1053 • P. O. Box 190

Industrial engineering techniques cut waste by simplifying construction operations for H. K. Ferguson Co.

Executives of the H. K. Ferguson Co., Cleveland, Ohio, discuss a project planning problem. Left to right: Thomas H. Mitchell, main office construction manager; Charles P. Stolberg, assistant chief of operations; Robert L. Cashen, vice president in charge of operations.

A typical pre-plan work sheet for concrete slab forms, for instance, will begin by first referring the foreman to the pages in the specifications covering the work. A short introduction follows which describes the over-all concreting problem on the building.

From here, the work sheet gives a step-by-step coverage of the proper procedures for forming, placing, and curing the concrete in the floor and roof slabs. The sheet is set up with spaces for each step assigned to work description, estimated quantity, estimated man-hours, type of craft, and cost code.

Typical Step

Floor slab work usually requires at least twelve successive steps. One of the first steps might read as follows:

"Set joists and lay plywood decking. Place wire saddles on floor beams 12 inches on center for spans up to 7 feet. For spans over 7 feet, use a spacing of 6 inches on center. Set notched filler of ⅝-inch plywood in place, drive hardwood wedge, lay and lightly nail to form joists 2-foot x 8-foot plywood sheets. See pre-plan diagram #1."

For the same step, the sheet would also supply an estimate of the number of square feet of plywood required and the number of man-hours required of both carpenters and laborers.

The drawing at the end of the section augments the work description by showing how the form is assembled.

Subsequent steps describe phases such as setting of sleeves and inserts, placing reinforcing, installing screed chairs, pouring concrete, finishing, curing, and stripping. In

(Concluded on next page)

New portable plant produces 7½ tons of ¾" aggregate per minute

TIMKEN® bearings absorb the shocks

THE "All American 77", Diamond Iron Works' new crushing and screening plant can be towed as a trailer or as a separate unit—yet it crushes as much as 450 tons per hour of ¾" aggregate in 25-35% crush, field reports say. To take the rugged shock loads, it relies on 18 Timken® tapered roller bearings: eight on the jaw crusher, six on the oversized star gear roll crusher, and four on the deck vibrating screen.

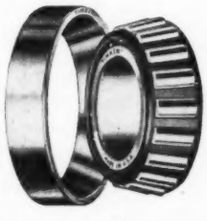
Timken bearings take the heavy, jarring shock loads with ease because the rollers and races are case-carburized to give them a hard, wear-resistant surface over a tough, shock-resistant core. And line contact between rollers and races gives them extra load carrying capacity.

The tapered construction of Timken bearings lets them take both radial and thrust loads in any combination. And by holding housings and shafts concentric, Timken bearings make closures more effective—keep dirt and moisture out, lubricant in. Maintenance costs are cut.

Specify Timken bearings for all the machinery you build or buy. You get longer life, less friction, minimum maintenance. Look for the trade-mark "Timken" on every bearing. The Timken Roller Bearing Company, Canton 6, Ohio. Cable address: "TIMROSCO".

This symbol on a product means its bearings are the best.

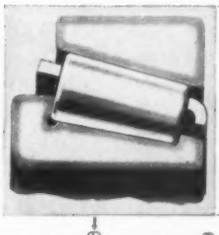
DIAMOND IRON WORKS, DIVISION GOODMAN MANUFACTURING CO., mounts the jaw crusher, roll crusher and deck vibrating screen on Timken bearings to assure less maintenance, longer life.



TIMKEN

TRADE-MARK REG. U. S. PAT. OFF.

TAPERED ROLLER BEARINGS



HARD ON THE OUTSIDE, TOUGH ON THE INSIDE

Rollers and races of Timken bearings are case-carburized to give a hard, wear-resisting surface and a tough, shock-resisting core. Result: longer bearing life.

The Timken Company leads in: 1. advanced design; 2. precision manufacture; 3. rigid quality control; 4. special analysis Timken steels.

NOT JUST A BALL ○ NOT JUST A ROLLER ⬭ THE TIMKEN TAPERED ROLLER ⬭ BEARING TAKES RADIAL ⬭ AND THRUST →⬭← LOADS OR ANY COMBINATION →⬭←

NEWCO* WIRE ROPE CLAMP & THIMBLE

*trade mark

. . . gives holding efficiency of 95 to 100%.

. . . will not collapse.

. . . no shearing of bolts.

BEARING SERVICE is many times heavier; for example, the ⅝" Newco has a ½" bearing surface! Carries a heavier load, and the original cost is easily absorbed by savings on labor and longer life. In 12 sizes.

⅜" to 1" size **STEEL CLAMPS** (Approx. 80,000 PSI's)

⅛" to 5/16" **MANGANESE BRONZE** (Approx. 110,000 PSI's)

See your distributor or write direct to

NEWMAN MFG. & SALES CO.

Dept. 104, Box 5939, Kansas City 11, Mo.

(Continued from preceding page)

each step, of course, the foreman is supplied with estimates of material quantities and man-hours.

This type of planning is carried out for every operation involved in the construction of a Ferguson building. The program has been highly successful in simplifying the work, reducing confusion, coordinating the trades, determining reliable delivery dates, and making maximum use of available equipment.

Pre-planning is also used successfully to maintain efficient distribution of manpower. Ferguson knows that methods and material planning is only part of the answer. For every operation, the proper crafts, number of men, time required, and position in the job schedule must be determined well in advance. When handled effectively, this system promotes efficiency by keeping all groups working on definite, pre-planned, scheduled operations.

Manpower scheduling on the average job is done by the methods engineer with the cooperation of the superintendent and foreman.

With the exception of a general schedule which is made up before the job starts, most scheduling is done on a weekly basis. To keep the program operating effectively, a fairly rigid procedure is followed. Usually on Wednesday the superintendent informs the methods engineer of the major items of work he wants scheduled for the coming week. The information is set up in rough form listing only the major items.

On the following day, the methods engineer breaks up each work item into its various operations. He then interviews each craft foreman to discuss his phase of the work and determine an estimate of the required number of man-hours. The engineer continues to contact all the foremen, working out a craft schedule with each, until the entire job has been covered and coordinated.

The craft schedules are then consolidated into a working copy of a general weekly manpower schedule. This copy lists the area of each operation, the pre-plan number, a description of the work, the total estimated man-hours, the total hours used to date, and the craft, and blank spaces are provided for a complete daily breakdown of actual work hours as compared to scheduled hours. The daily breakdown, of course, is filled in during the following week as the work is being done.

Friday Conference

On Friday, the schedule is reviewed briefly by the superintendent and is then ready to be discussed by all concerned. Early in the afternoon, the superintendent, methods engineer, field engineer, chief accountant, clerks, and foremen hold a conference. After the superintendent's briefing on the coming week's work, members are free to discuss any problems. Typical subjects for discussion are craft jurisdictions, increasing or decreasing the working forces, overcrowding in work areas, alternate assignments, availability of materials and equipment, and changes in pre-plans.

This type of meeting has several advantages. The most important, of course, is the fact that every foreman knows exactly what he will do next week and has his own estimate of the man-hours required. At the end of the week he will be able to determine whether or not he met his goal, and why. This system undoubtedly keeps the foreman striving to reduce costs and increase efficiency. And as a sidelight, it definitely makes him more interested in his work and in the progress of the job as a whole.

The size of the program varies considerably depending on the project, but in all cases the basic Ferguson policy is applied. THE END

Data on Excavator-Crane

■ A catalog describing its new 1½-yard shovel excavator that converts to a 35-ton crane is available from the American Hoist & Derrick Co., 63 S. Robert St., St. Paul 1, Minn. Photographs show the American Model 750 excavator-crane working in quarries and gravel plants.

The machine is available in a choice of diesel, gasoline, or electric models. Features covered include graduated air controls, independent one-purpose shaft assemblies, a box-section-type boom and dipper stick, and 40-inch-diameter boom sheaves. The unit converts to a 2-yard clamshell or dragline and a 1½-yard backhoe.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 809.

Maintain Equipment at Less Cost . . . with the *Air Master* COMPRESSOR

★ Keep Tires Well Aired
★ Pressure-Grease Machinery
★ Spray-Paint Equipment
★ Operate Air Hammer

Adjustable pressure setting, 50-150 lbs, 8.5 C. F. M. displacement. Has 3 H. P. Kohler air-cooled engine, governor. 20-foot hose has air chuck, brass fittings.
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DRAGLINE BUCKETS

give you more of what you need...

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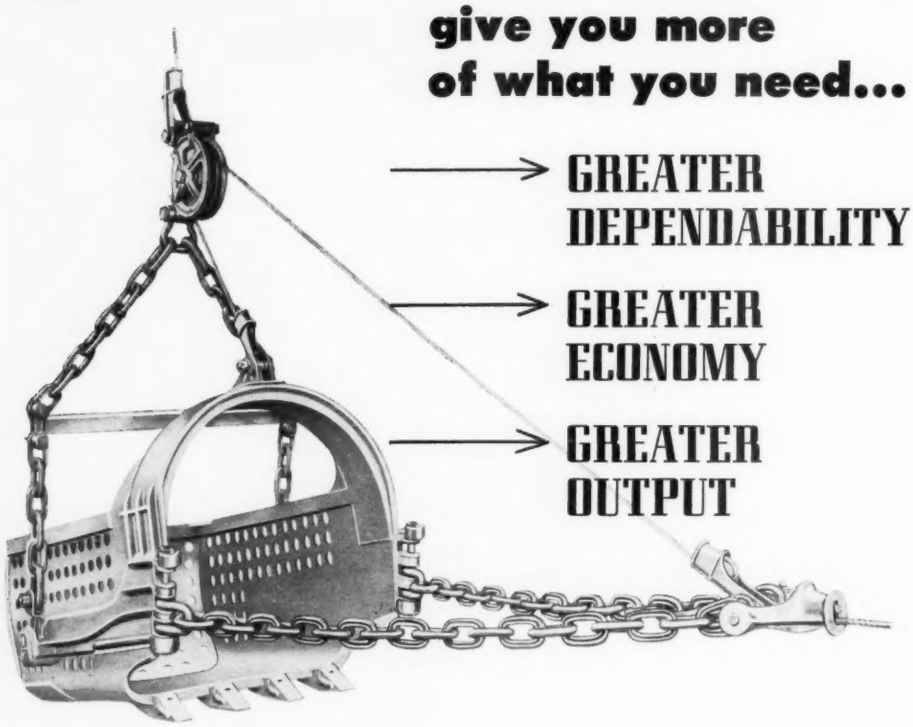
→ GREATER OUTPUT



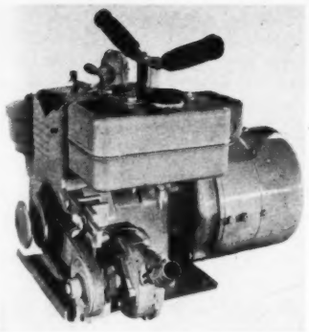
3/8 to 40 Cubic Yards

A TYPE AND SIZE FOR EVERY DIGGING PURPOSE

Hendrix Lightweight Dragline Buckets

Hendrix Buckets available without perforations on special order.

HENDRIX MANUFACTURING CO., Inc.
MANSFIELD, LOUISIANA



The new Universal Handi-Plant combination electric generator, pump, and battery-charging set.

Generator-Pump Unit Charges Batteries Too

■ A combination electric generator, battery-charging set, and portable pump has been developed by the Universal Motor Co., 524 Universal Drive, Oshkosh, Wis. The Handi-Plant is powered by a one-cylinder, 1.7-hp air-cooled four-cycle gasoline engine. The direct-connected generator supplies 110-volt single-phase 60-cycle ac and has a capacity up to 600 watts.

The pump is capable of a suction lift of 15 feet and has a 1,500-gph capacity. Capacity of the plant while pumping water and generating electricity at the same time is 1,500 gallons of water and 300 watts of electricity. It also furnishes 80 to 100 watts dc for charging six-volt batteries.

For further information write to the company, or use the Request Card at page 18. Circle No. 736.

Timber Engineering Research Service

■ A booklet for users of wood tells of the service offered by the Timber Engineering Co., 1319 18th St. N. W., Washington 6, D. C. Affiliated with the National Lumber Manufacturers Association, this company has acted as a lumber industry service organization since 1933. Its research program develops new and more economical uses of wood, forest products, and their derivatives.

As the lumber industry's central clearing house for timber design information, Teco has developed hundreds of designs covering light and heavy-frame structures from small houses to huge warehouses, bridges, and towers. Over 270 of the most representative of these typical designs are available to architects and engineers upon request.

To obtain this literature write to the association, or use the Request Card that is bound in at page 18. Circle No. 741.

New Galion Sales Manager

Appointed eastern division sales manager of The Galion Allsteel Body Co., Galion, Ohio, is R. H. Tomlinson, the company's former regional representative in Kentucky, Alabama, Mississippi, Louisiana, and Arkansas.

Mr. Tomlinson will direct sales and service of the company's dump bodies, hydraulic hoists, and Loadevator hydraulic tailgates in all states east of the Mississippi River. He will make his headquarters in the Galion plant in Galion, Ohio.

Wellpoint Services Detailed in Booklet

■ A wellpoint manual prepared to enable contractors, engineers, and architects to use wellpoints efficiently on ground water problems is available from the John W. Stang Corp., 2 Broadway, New York, N. Y. The booklet illustrates the equipment and services offered to contractors in every part of the country by this organization. It includes photographs showing the use of wellpoints on many types of pervious and semipervious soils including sand, gravel, or stratified mixed materials. A cutaway drawing shows a typical dewatering job with Stang pumps and wellpoints.

The booklet gives details on the wellpoints and pumps available for various water problems and describes the planning of a wellpoint installation for particular jobs. The jet method and the sand casing method of installing wellpoints are discussed in some detail.

To obtain this literature write to the company, or use the Request Card that is bound in at page 18. Circle No. 764.

Flexible Steel Appoints

Representing the Flexible Steel Lacing Co. in the Canadian Provinces of Ontario and Quebec is Jack Graham. The Chicago, Ill., firm manufactures belt fasteners for joining conveyor, transmission, and V-belts.

Fleet of SWENSON-Equipped Trucks Speed Blacktop Jobs

Contractors save money with Swenson Spreaders. Write for information.

Swenson Spreader & Mfg. Co.
Lindenwood, Illinois

How to keep crawler parts operating longer

Replacing worn shovel parts is costly ... for example, the sprocket, tumbler and track assembly illustrated, which represents a considerable outlay.

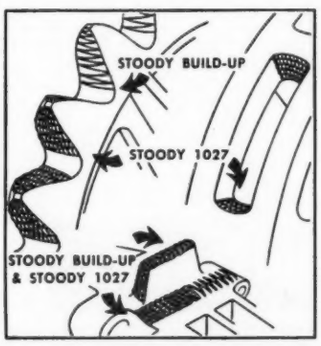
The experience of a large pipeline company operating in the West, provides a good example of maintenance procedures that cut replacement costs and save lost equipment time. Two sets of sprockets, tumblers and tracks are maintained for each backhoe. The spare set is rebuilt and hard-faced on regular shop time. It is ready for instant use when needed. When the track shows signs of slipping, the rebuilt equipment is sent out, worn parts are removed and the spares installed on location.

NUMEROUS ADVANTAGES

Work schedules in the welding department are thus smoothed out, since rebuilding and hard-facing jobs can be used as "time fillers" at the welder's convenience without overtime costs.

Shovel down-time is reduced. Only enough time is lost to pull worn assemblies and substitute the spares. Shovels are immediately put back on the job.

Although no exact record is available, careful observation over a long period of time indicates an almost indefinite increase in service life for these specific parts. The procedure has proved so successful it is now adopted as standard practice.



REBUILDING & HARD-FACING PROCEDURES

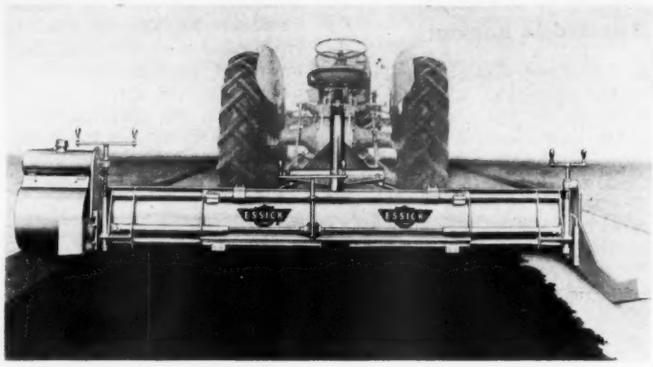
Wear patterns are the key to the most effective use of hard-facing. Worn areas of sprocket teeth, lugs and tumblers are rebuilt to within 3/16" of final size with Stoody BUILD-UP, which provides a rigid base to properly support the hard-facing alloy. A final pass of Stoody 1027 supplies good wear resistance with high impact strength. These same alloys are used on the pads to restore size and renew life.

These and other hard-facing applications are fully described in the Stoody Guidebook. Ask your Stoody dealer or write for a free copy.

STOODY COMPANY
11936 East Slauson Avenue
Whittier, California

Roller and Skid On Bituminous Spreader Maintain Finish Level

■ The new Essick Model 710 bituminous spreader features a roller and skids that serve as a guide for leveling high and low spots in the base grade. To pave with the new spreader, a narrow track of the paving material is raked to the thickness specified for the finished surface at one edge of the paving area. The roller on one end of the spreader rides on this track. The spreader blade is then leveled to the proper clearance by adjusting the steel skid on the opposite end to conform to the level of the specified thickness. This long skid glides on the base-grade and spreads the materials smooth and level for the full width



of the adjustable spreader blade.

The spreader is furnished with two steel skids which attach to either side as required. The skids are adjusted by turning twin handles attached to a threaded shaft that is part of the skid attachment. The roller is furnished with a fluid tank and sprinkler system that keeps the cold or hot blacktop materials from sticking to the surface of the roller.

Specifications list the maximum width of the spreader blade as 10 feet 4 inches. Maximum over-all operating width of the spreader is 13 feet 9 inches with the roller and one skid, and 12 feet 7 inches with 2 skids. Maximum blade clearance is 6 inches.

For further information write to the Essick Mfg. Co., 1950 Santa Fe Ave., Los Angeles 21, Calif., or use the Request Card at page 18. Circle No. 784.

Diesel Maintenance Kit

■ A diesel maintenance kit that consists of a compact metal carrying case containing both the American Bosch nozzle-test stand and a nozzle-cleaning kit is available. The kit makes it possible for diesel injection spray nozzles to be tested and cleaned on the job.

The nozzle test stand has an actual fuel-injection pump to make sure the nozzles being tested are subjected to approximately similar hydraulic conditions as are encountered on an engine. A filter is also included to protect the nozzles from being accidentally injured by dirt. The fuel-oil reservoir is of ample size, and a pressure gage reading to 5,000 psi facilitates setting of nozzle opening pressures. This tester is suitable for nozzles of the American Bosch R, S, and T sizes and is the standard type recommended for use by authorized service stations.

For further information write to the American Bosch Corp., Springfield, Mass., or use the Request Card at page 18. Circle No. 742.

Highway Joint Products

■ A variety of paving products is described in a reference folder from the Keystone Asphalt Products Co., 101 E. Ontario St., Chicago 7, Ill. Under the trade name Kapco, this company manufactures a complete line of expansion joints and paving accessories for virtually every type of concrete installation. Principal products include asphalt and fiber expansion joints, tongue-and-groove joints, joint fillers, and non-rotting Fiberglas expansion joint and edge insulation.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 754.

"I get these Heaped Loads every cycle!"

Paul Crawley, fast-moving Illinois contractor, tells how he moved 197,700 cubic yards in 13 days.

"It takes more than luck," says Paul Crawley, Edwardsville, Ill., *"when you start a big job three weeks behind schedule—and catch up in two short months!*

"We did it with a team of top operators and mechanics, using the right kind of equipment for the job."

After being held up for 3 weeks by heavy rains, Crawley's fast-moving crew went into action May 1. Soon they were putting a heaped load on the Cahokia Levee every 20 seconds. In one 13-day period, they moved 197,700 cubic yards. By July 1 they had caught up—were actually three days ahead of schedule!

If you have dirt to move, with time and costs to consider, see the man who can help you most—your IH Industrial Distributor. Ask him about rugged, simple INTERNATIONAL "Job-Phased"* equipment that does such an outstanding job for contractors.

Loadin' on the levee for the Cahokia Creek Diversion Channel, near East St. Louis, Ill., one of Paul Crawley's three INTERNATIONAL TD-24 crawlers with INTERNATIONAL B-170A scrapers walks away with a heaped load to help make time on a tight schedule. The excellent flotation of the INTERNATIONAL Scraper, its fast fill, short turning radius, remarkable stability and fast, clean dumps were big factors in Crawley's great record on this job.

INTERNATIONAL HARVESTER COMPANY, CHICAGO 1, ILLINOIS

For every move in Earthmoving

ON TRACKS ...ON RUBBER

See INTERNATIONAL'S "Job-Phased" equipment

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POWER THAT PAYS

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*Phased Equipment—Machines designed and built to handle each major phase of earthmoving most efficiently and economically.

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Camden 1, N. J.
Telephone
Merchantville 9-7040

Order Early July For Early September Delivery

Engine Is Improved With Electric Starter

■ The Model K660, a four-cycle heavy-duty engine announced late in 1953 by Kohler Co., Kohler, Wis., is now available with an electric starter. Designated as the K660S, the new model is equipped with a 6-volt electric starter and generator, ignition switch, and starter button.

Standard features include an impulse coupling magneto, a silencer-type muffler, valve rotators, an automotive diaphragm-type fuel pump, an oil-bath cleaner, and an oil-pressure gage. The specially designed air-cooling system keeps the engine at correct temperatures under all operating conditions.

The new unit provides 26.8 hp at 3,600 rpm, 24.4 hp at 3,000, 19.9 hp at 2,400, and 15 hp at 1,800 rpm.

For further information write to the company, or use the Request Card that is bound in at page 18. Circle No. 813.

Concrete Vibrators

■ A line of concrete vibrators is illustrated in literature from Messenger Vibrators, P. O. Box 124, Fair Haven, Mich. The Messenger concrete vibrators are built for heavy-duty work. They are used in such work as compacting concrete around reinforcing rods and against forms in spots where hand puddling is difficult. They are suitable for work on pavements, bridges, dams, abutments, buildings, and culverts. An angle head is available to convert these units for concrete grinding. The units are available in jack-shaft and direct-drive models.

The literature has a cross-section view of the vibrating head. This shows two single rows of antifriction ball bearings at each end of the rotor shaft. A single ball thrust bearing ¾ inch in diameter, is at the end of the rotor revolving on a bearing metal base in the nose. This construction is said to increase the life of the vibrating head under severe usage.

The flexible shafts on which the head is attached are available in 7 and 14-foot sections, and extra lengths may be joined by a special connector.

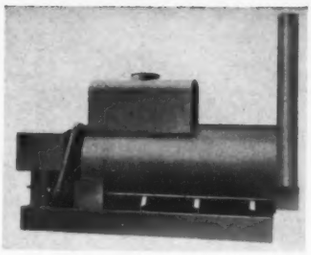
The vibrators described are powered by air-cooled Wisconsin or Briggs & Stratton engines, or by single and three-phase electric motors. Horsepower ratings range from 1 to 4. The units are mounted on a swivel base and may be obtained with a rubber tire and with wheelbarrow-type handles.

To obtain this literature write to the company, or use the Request Card that is bound in at page 18. Circle No. 731.

New Hot-Oil Heater For Asphalt Plants

■ A new heater for asphalt storage tanks and for jacketed lines in hot-mix plants is announced by the W. E. Grace Mfg. Co., 6003 S. Lamar St., Dallas, Texas. The skid-mounted machine burns gas or oil and is electrically operated. Automatic ignition and controls, providing safety, require a minimum of the operator's time.

Heating is accomplished by circulating heated oil through coils in the storage tanks and through the jackets of asphalt and pugmill lines.



The new Grace No. 2 oil heater for asphalt plants and storage tanks.

For further information write to the company, or use the Request Card at page 18. Circle No. 814.

Truck-Mounted Backhoe

■ A truck-mounted backhoe that can be used as a digger, shovel, crane, and loader is illustrated in literature from the Avery Tractor Co., Hancock, Mass. The hydraulically operated Samson machine digs to 11 feet in depth, lifts up to 12 feet high, and has a 180-degree digging radius. Capacity of the backhoe bucket is ¼ yard. It loads to a height of 7 feet 6 inches. Lifting capacity of the engine-driven machine is 2,000 pounds.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 763.

Why the MICHIGAN* Tractor Shovel moves bigger yardage – *the Clark Torque Converter*®

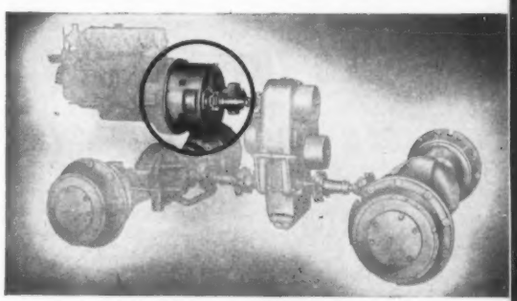
You can do miraculous things with a MICHIGAN* Tractor Shovel because of *extra power when it's needed*—a result of 3-to-1 torque multiplication in the CLARK Torque Converter.

● **Digging into TOUGH Material**—watch a MICHIGAN *force* its bucket into tough, compacted material: not a "shock" action—but a steady, resistless flow of *increasing power* that puts no punishing strain on the driving shafts and gears. Torque multiplication plus the terrific digging power of the hydraulic bucket rams enable the MICHIGAN to perform unbelievable feats.

● **Maintenance and Down-time reduced to a minimum**—the CLARK Torque Converter eliminates the engine clutch: the weakest link in a conventional power-train and the unit most frequently requiring repair.

● **Make ANY Shift at ANY Time**—with the Torque Converter, driving is as easy as handling your car! Shift into Forward or Reverse, into High or Low range *while moving in either direction* . . . the Torque Converter absorbs shocks.

● **Standard Equipment on All Models**—Clark is first to present a full line of Tractor Shovels with Torque Converter as standard equipment. See the MICHIGAN Tractor Shovel. Watch it in action, demonstrating its astonishing power, speed and maneuverability.



Talk to your MICHIGAN dealer; and send for the MICHIGAN Fact Folio, handy file of specifications and action photos—the coupon gets prompt action.

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10

CLARK EQUIPMENT

CLARK EQUIPMENT COMPANY
Construction Machinery Division
384 Second Street
Benton Harbor, Michigan

Please send the MICHIGAN Tractor Shovel FACT FOLIO

Name_____ Title_____

Firm_____

Address_____

City_____ County_____ State_____

Arabs, trained on the job by American construction men, work on a low-cost family housing unit being built at Wheelus Field, U. S. Air Force base, Libya, North Africa.

Job-Trained Local Labor Helps Build African Base

NATIVE LABOR used in constructing Wheelus Field, the U. S. Air Force base near Tripoli, Libya, was one of the factors contributing to speedy work on this $60 million North African facility. After leveling a 10-foot layer of sand which winds had deposited over limestone and marl, crews placed two 8-inch layers of crushed stone, rolled the stone, and topped it with a 6-inch asphalt pavement. Included in the installation are two 11,000-foot runways, having a 1,000-foot overrun at each end; lubricant, oil, and petroleum storage facilities, and refueling platforms for planes.

Starting work in 1951, the contractors, William L. Crow Construction Co., and J. Rich Steers, Inc., both of New York, N. Y., and the Shepherd Construction Co., Inc., Atlanta, Ga., were advised by local government officials that only a limited number of craftsmen were available to work on the project. Since the original program was scheduled to run 12 to 15 months, it was decided to job-train the local supply of labor. This meant the contractors had to requisition American construction men qualified to carry out an on-the-job training program and still keep the project on schedule.

By May of 1951, when operations had been under way two months, 170 craftsmen had been trained, 58 of whom were Arab. At the same time, a group of 11 foremen, supervisors, specials and highest-type technicians had also been trained. Ten of these were Europeans, and only one was an Arab. Since the project had to go forward at a faster pace, personnel brought in from the U. S. were asked to give special attention to the training problem. Local authorities were asked to secure a group of boys from a poorhouse and orphanage for work on the base. These boys were assigned to carpentry, sheet metal, plumbing, electrical, masonry, mechanical, and heavy-equipment jobs.

By July of the following year, 1,304 craftsmen, 756 of them Arabs, had been trained. There were 61 Arabs in the higher-type group. By July of last year, 1,177 Arabs were among the 1,733 craftsmen who had been trained, representing 68 per cent of the total craftsmen on the job. In the higher group were 120 Arabs—42.1 per cent of the total of 285 employees.

Excluding American administrative and top field supervisory employees, there was only one American to every 35 local employees on the job. Depending on local conditions and the previous experience of the people, it is believed that a 50 to 1 ratio could be maintained on a longer-range program. THE END

The 327-mile Pennsylvania Turnpike carried a record of 12 million vehicles last year, which produced a record $22,124,000 in revenue.

23-Acre Research Center or Site for Small Homes . . .

GAR WOOD Handles ANY Size Job!

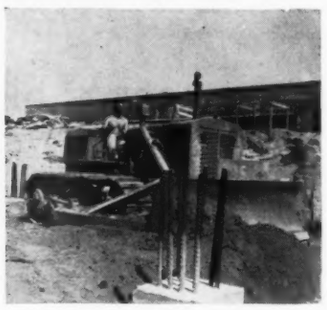
In the top photo, All-Tech Construction Co. use their Allis-Chalmers HD-15, equipped with Gar Wood hydraulic dozer, to handle approx. 50,000 yds. of excavation and land leveling for the Belmar Gardens Housing Project near Pittsburgh, Pa.

In the small photo, an HD-9, also equipped with a Gar Wood hydraulic dozer, is back-filling footing excavations for a building at the new Army Research Center near Natick, Mass. This 23-acre, $11 million project will provide complete development and evaluation facilities for over 40,000 items of Quartermaster equipment and will contain two of the world's largest personnel climatic chambers.

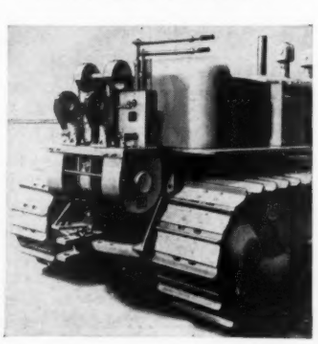
On jobs of any size—in any location—the tractor-dozer team is an integral part of the operation. Every Gar Wood dozer is designed, manufactured and tested to insure a perfect match with every Allis-Chalmers crawler tractor. The team gives you matched earthmoving equipment that is your answer to more work—at less cost—with more profit.

GAR WOOD CABLE CONTROL UNITS

The tractors illustrated are equipped with Gar Wood hydraulic dozers. 3 cable control units are offered for use with cable operated equipment. Shown at right is the medium-duty model 261 double-drum unit for dozer and scraper work. The heavy-duty model 281 is similar. A single drum, front-mounted unit, model 151, is also available where only dozer operation is required. All units are of planetary design for smooth, fast and accurate control.



GARWOOD CABLE CONTROL UNIT



M-4017N

GAR WOOD INDUSTRIES, INC.

TRACTOR EQUIPMENT SALES • WAYNE, MICHIGAN

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KIESLER Since 1892

2-LEVER ARM CLAM SHELL BUCKETS with POWER ON BOTH SHELLS

"A PAYLOAD EVERY TRIP"

The ONLY Bucket that DIGS-IN instead of Lifting-Out.

Write for literature.

JOS. F. KIESLER COMPANY

934 W. HURON ST. CHICAGO 22, ILL.

First Moving Sidewalk Has Belt 460 Feet Long

The world's first passenger belt conveyor now is in operation in Jersey City, N. J., where it serves homeward-bound New Jersey commuters at the Erie tube station of the Hudson and Manhattan Railroad. Known as a Speedwalk, the conveyor transports passengers for a distance of 227 feet up an inclined ramp leading to the Erie railroad terminal.

The Speedwalk was designed by the Goodyear Tire & Rubber Co., Akron, Ohio, and the Stephens-Adamson Mfg. Co., Aurora, Ill. Hudson and Manhattan crews spent a month installing the 30 tons of conveyor equipment and machinery.

The conveyor belt is ⅝ inch thick and 460 feet long. Operating at a speed of 120 fpm, the conveyor will deliver passengers who walk along its moving surface to the end of the ramp in 35 seconds, compared with a normal upgrade walking time of 55 scconds. The unit negotiates a ten per cent grade for the first 137 feet. It can accommodate 10,800 persons an hour, although only about 9,000 passengers now use the station daily.

A 20-hp electric motor drives the endless belt, which rides a bed of closely spaced steel rollers or idlers. The rubber and fabric belt is 5½ feet wide and weighs 11,000 pounds, and the sidewalk has moving handrails. The system, which is reversible, will be operated upgrade and between the hours of 7 a. m. and 7 p. m. only for the present.

Although numerous designs for moving sidewalks have been submitted during the past 50 years, few have measured up to rapid transit requirements of speed, utilization, and safety. The Speedwalk has been under development by Goodyear and Stephens-Adamson for four years.

W. A. Davis was general superintendent of Hudson and Manhattan crews during construction of the passenger belt conveyor.

◄ Workmen install the underside return for the handrail belt on the upgrade section of the world's first moving sidewalk, operating at the Erie tube station of the Hudson & Manhattan railroad at Jersey City, N. J. This section of the unit negotiates a 10 per cent grade.

Data on Washing Plants And Classifying Equipment

■ A new catalog just released by Eagle Iron Works, 159 Holcomb Ave., Des Moines 13, Iowa, describes the latest designs of Eagle washing - classifying - dehydrating equipment. The new tub design of the single and double-screw washers with adjustable long weir is shown. The new adjustable gate splitters for Eagle water scalping tanks are also described.

The operation and advantages of the units' water-lubricated lower bearing is covered, and a page is devoted to Eagle complete washing and classifying sections for aggregate plants.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 760.

Portable Compressors

■ Its line of portable air compressors is shown in literature from the Joy Mfg. Co., Oliver Bldg., Pittsburgh 22, Pa. Operating features are covered in a detailed description and further explained with specifications and illustrations.

This bulletin describes two new sizes of portable compressors of 75 and 125-cfm capacities. The entire Joy line is offered in six sizes, including Model 630, which is said to have the largest capacity on the market today.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 693.

PERFORMANCE:

"If you think your rigs can match our Drott's— *bring 'em around!"*

Says N. S. Purtee, Genoa Construction Co., Genoa, Ohio. "We bought our first Drott Skid-Shovel last year, and in nine months we dug out and loaded over 140,000 tons of road screenings and farmed 300 acres to boot. We worked it continuously — up to 16 hours a day — and were so amazed at its performance, that we just bought another Drott Skid-Shovel. When anyone mentions competitive equipment, we tell him to bring it around and try to keep up with our Drotts."

We know that contractors like Mr. Purtee are wise buyers. They examine the facts — compare features and choose the best value. Drott's many patented and exclusive features make the Skid-Shovel so rugged . . . so versatile . . . so productive, that owners keep them busy on profit making jobs all year 'round.

Examine the facts . . . and you'll be amazed at the many "extras" Drott gives you. For instance, pry-over-shoe Break-Out Action, exclusive with Drott, exerts a tremendous digging force (up to 13 tons) without straining the tractor. The Hydro-Spring, exclusive with Drott, reduces destructive hydraulic shocks to less than ⅓ of their original force, thereby saving the loader, tractor and operator. Shoe transportation, with bucket roll back at ground level, exclusive with Drott, enables the Skid-Shovel to semi-skid its load on the ground and to travel over rough terrain without losing the load — this feature combines excellent balance with 360° visibility.

Shown here, left to right, are N. S. Purtee, Bassette Sheldon, and Robert Strohscher, of the Genoa Construction Co., Genoa, Ohio, who report that their Drott Skid-Shovels load out an average of 1,850 tons per machine in a 10 hour day. In a tough, driving business where only performance pays off, these experienced operators say — "No other loader can compare with our Drott."

Drott Skid-Shovels are designed exclusively for International TD6, TD9, TD14A and TD18A crawler tractors. For a demonstration, contact your International Distributor today! For complete details, write for catalog 101.

DROTT MANUFACTURING CORPORATION
Milwaukee 8, Wisconsin

Here two DROTT SKID-SHOVELS are at the job of removing 100,000 tons of waste limestone from a U. S. Gypsum Co. plant. It is loaded into trucks and transported to an expressway site where it is used as a subbase. Note the exclusive bucket roll back action at ground level — exerting a tremendous digging force more than the weight of the tractor.

DROTT SKID-SHOVELS also have higher lift and greater reach than any other comparable equipment. Equipped with patented Hydro-Spring, an exclusive shock absorber on Drott equipment, destructive shocks are reduced to less than ⅓ of their original force, thereby saving strain on the tractor, loader and operator.

Jobs Done Quicker, Cheaper

Attached to Tractors, Bulldozers, Motor Graders and Scrapers, the Automatic Slope-Meters are in use on the construction of highways, airports, dams and building sites. Slope-Meters are compact, sturdily constructed instruments that will automatically show the operator the exact grade or slope on which he is working.

Order from Your Equipment Distributor Today
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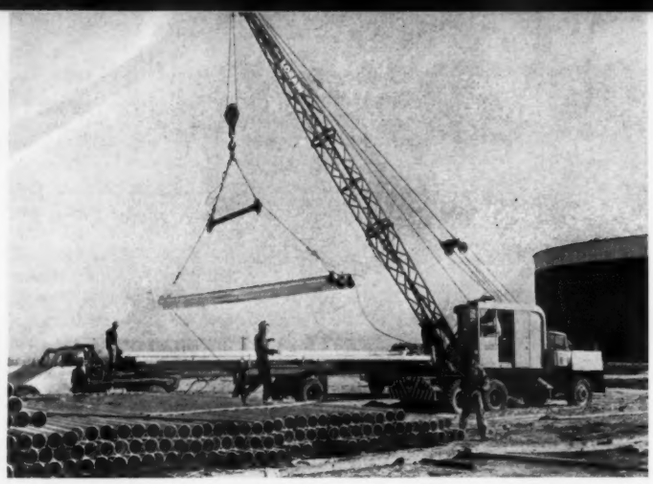
THE SLOPE-METER CO. EXCELSIOR, MINN.

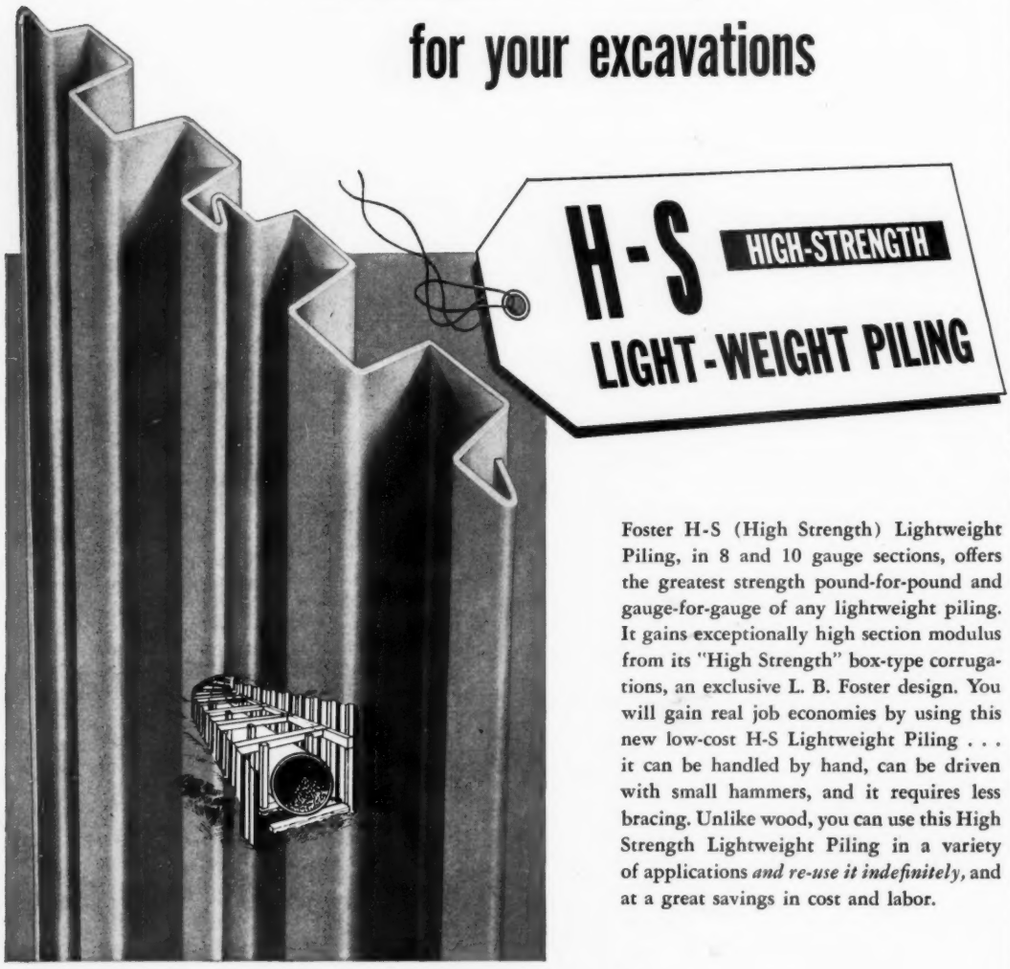
CONSTRUCTION CAMERA



New Kind of Pipeline—Aluminum alloy pipe, destined for the first aluminum pipeline, is stacked by a Lorain Moto-Crane. The machine's spreader bar and 40-foot boom enable it to handle three lengths at a time. The pipeline will run 12 miles from the new Reynolds Metal Co. plant in Corpus Christi, Texas, to the White Point gas field.

Dressing Slopes—Reaching beyond the toe of the slope on the Michigan Forest Highway, this Schield Bantam dragline brings excess dirt back to a point where it can be reached by a blade. The slope trimming is part of the grading contract held by William H. Gilliland Co., Alpena, Mich.

the new economical sheeting for your excavations



Foster H-S (High Strength) Lightweight Piling, in 8 and 10 gauge sections, offers the greatest strength pound-for-pound and gauge-for-gauge of any lightweight piling. It gains exceptionally high section modulus from its "High Strength" box-type corrugations, an exclusive L. B. Foster design. You will gain real job economies by using this new low-cost H-S Lightweight Piling . . . it can be handled by hand, can be driven with small hammers, and it requires less bracing. Unlike wood, you can use this High Strength Lightweight Piling in a variety of applications *and re-use it indefinitely*, and at a great savings in cost and labor.

Rent or Buy

Buy your basic needs in Foster H-S Lightweight Piling and fill in for special jobs by using our low cost RENTAL plan. Immediate deliveries of exact sections and lengths your job needs, whether you buy or rent. Standard heavy duty, interlocking steel-sheet piling also available from the L. B. Foster warehouse or field stocks nearest you.

Send for our descriptive bulletin with drawings of available sections. You'll see how our new design Interlock gives a water-tight wall, permits simple folding together of two sheets without having to slide one into the other the entire length. Additional economies — more reason to write today for our Bulletin CE-7.

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Texas Highway Official Is Lecturing in Europe

D. C. Greer, Texas state highway engineer, is in Europe for a series of highway and traffic lectures sponsored by the International Road Federation. He is speaking in eight countries on highways, particularly as they were constructed and maintained in Texas, and on traffic engineering.

A highlight of his tour will be an address on highway traffic operation and construction of secondary roads before the Scandinavian Technical Road Congress in Oslo, Norway. He is also slated to speak before groups in France, Germany, Holland, Denmark, and Great Britain.

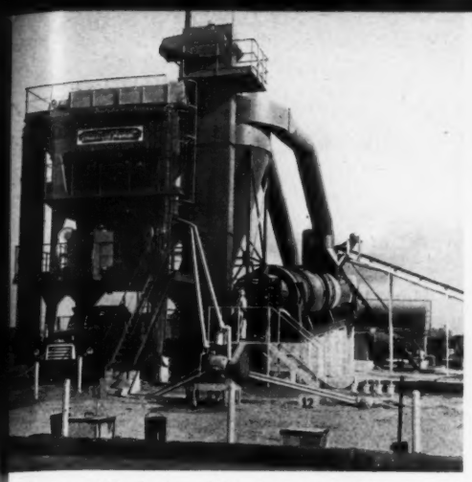
Mr. Greer has been with the Texas Highway Department since 1937, and has been state highway engineer since 1940. He is a past president of the American Association of State Highway Officials, and in 1953 received the George S. Barlett Award as America's outstanding highway engineer and administrator.

Turkish Plant Established By Minneapolis-Moline Co.

A 25-year agreement, signed by Minneapolis-Moline Co., Minneapolis, Minn., the Turkish Agricultural Bank, Turkish government agencies, and private investors, has established a Turkish company, Minneapolis-Moline Turk Traktor ve Makineleri, A. O. The company will be incorporated under Turkey's foreign investment law of 1954 with an initial capital of 20 million Turkish lira—roughly $7 million.

Plant facilities, located on a 70-acre tract five miles from Ankara, include a modern airplane engine factory, foundry, warehouses, laboratory and test building, general offices, and cafeteria.

Minneapolis-Moline officials of the new corporation are William F. Foss, managing director; Arthur W. Huff, general sales manager; and J. L. Collins, superintendent. Mr. Foss and Mr. Huff were executives at the firm's general offices, and Mr. Collins was plant superintendent at the Twin Cities' Como and New Brighton plants. Minneapolis-Moline, manufacturer of industrial power units, will use American personnel to recruit and train Turkish workers for the factory and office.



Increased Production—With the recent addition of this 4,000-pound-capacity Sstandard Steel asphalt plant at Claremont, Calif., Industrial Asphalt brings to eight the number of hot-mix plants which it now has in operation.

Stable Ground—McCarthy truck-mounted vertical drill bores relief wells in the sands beneath the twin bridges carrying the Ohio Turnpike across the Cuyahoga River. The wells will supply an outlet for underground water.

Farm Grading—Making an average 6-inch cut, an Allis-Chalmers TS-200 hydraulically controlled motor scraper relevels 160 acres of land under cultivation in California. Loading time with a pusher tractor averaged 25 seconds.

McGraw Celebrates 25th Anniversary

With nine projects under construction, including the billion-dollar uranium separation plant for the Atomic Energy Commission at Paducah, Ky., F. H. McGraw & Co., this year is marking the 25th anniversary of its founding.

Started in New York, N. Y., in 1929, the company has since then been represented on nearly 700 construction projects, including steel mills, chemical projects, manufacturing plants, power plants, and public works projects. The engineering and construction firm's main office is now located in Hartford, Conn., and branch offices are in New York, Chicago, and Pittsburgh. Publicly held since 1946, the company has almost 1,100 stockholders.

The company's first job was the building of the Pennsylvania Railroad's multimillion-dollar Harborside Terminal and an adjoining pier on the Hudson River at Jersey City. The current Paducah contract was given to McGraw in 1950.

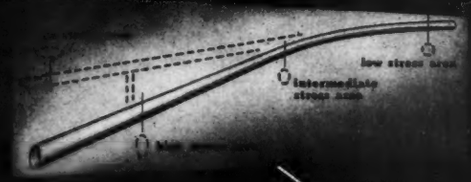
A-C Division Promotes Two

In two appointments, Allis-Chalmers Mfg. Co., Milwaukee, Wis., has named R. C. Allen director of mechanical engineering and L. J. Linde director of electrical engineering, both for the general machinery division.

Mr. Allen, consulting engineer in the office of the director of engineering for the past three years, joined the company in 1936. He served in various positions in the steam turbine department until he became manager and chief engineer of the turbo-power development department in 1947. Mr. Linde served as assistant general manager and chief engineer for the Boston works before his present appointment.

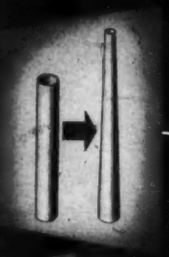
Davey Makes Appointment

Appointed northwestern district manager of the Davey Compressor Co., Cleveland, Ohio, is W. J. McClure. Formerly associated with International Harvester Co., The Buda Co., and Cummins Northwest Diesel Sales, Mr. McClure will be in charge of Davey's compressor and air tool sales in the Pacific Northwest. He will make his headquarters in Seattle.



FIRST to provide ample strength in all-aluminum arms and arm-shaft joints through patented, seamless elliptical arms requiring no bracing for lengths up to 8 feet. On longer arms, one horizontally elliptical member, integrally welded to the arm, eliminates need for side-sway bracing.

FIRST to develop fabricating equipment and methods to permit use of high strength aluminum alloys.



FIRST to develop and produce seamless, tapered shafts from high-strength, extruded tubing in a wide range of diameters.

FIRST to pioneer the Aircomatic method of welding for fast, strong welds and negligible deterioration of alloy strength. All P & K welds are guaranteed . . . all P & K welding personnel and equipment is certified by U. S. Government agencies.

FIRST to stress use of castings of heat-treatable aluminum alloy, and first to introduce permanent mold castings for transformer bases, shoe and pedestal bases . . . with smooth surfaces and strong grain structure.

Seven firsts . . . . . All are P&K

P & K . . . Producer of America's Most Modern All-Aluminum Standards and Brackets FOR LIGHTING TRAFFIC SIGNAL POSTS — TRAFFIC AND COMMERCIAL SIGN POSTS

SEVEN P & K FIRSTS! They add up to this: P & K All-Aluminum Standards, Arms and Posts do the job better, easier and at far less cost than any other "pole" of any other material or design.

WRITE FOR THE NEW P & K CATALOG . . . and use the planning and advisory services without obligation.

FIRST to eliminate unnecessary scrolls, tie-rods and other ornamental frills.

FIRST to design and build its own tapering machine to handle all diameters of extruded aluminum tubing.

Pfaff & Kendall

84 Foundry Street
Newark 5, New Jersey

CONSTRUCTION CAMERA

Pumps Keep Working—Marlow self-priming pumps, taking the place of gasoline pumps, transfer fuel from underground tanks to equipment working on the New York Thruway. A. L. Dougherty Co., Indianapolis, Ind., earthmoving contractor, here has the units connected to Neptune Meter Co. 1-inch Trident meters. *Jim Connolly Photo*

Serpentine Walls—Symons prefabricated plywood forms are in place for a first-lift pour on one of the 15-inch-thick concrete walls being built by Butler Construction & Engineering Co., Seattle, Wash., for sand and gravel storage. These curved walls, shaped to a radius of 15 feet 6 inches, will serve as bunkers for the material.

"I was promised delivery today,

but now I'm told you've no stock of one rope and only half enough of another. This delay is costing me money and plenty of it. From now on it's Roebling for me!"

* * *

You can count on prompt and full delivery of Roebling wire rope. Your nearest Roebling office and distributor will help you choose the rope that will perform and stand up best in excavating and construction service. And you'll get what you want, when you want it—straight from nearby warehouse stock.

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Army Waterways Station In Operation 25 Years

Rounding out a quarter-century of research and experimental work which has saved millions of dollars, the Vicksburg and Jackson, Miss., installations of the Waterways Experiment Station of the U. S. Army Corps of Engineers last month opened their doors to some 10,000 visitors as part of the anniversary celebration.

Begun after the disastrous Mississippi River flood of 1927, the station has since grown from a small hydraulic laboratory devoted to Mississippi flood-control studies to an experimental facility engaged in research on hydraulics, soils mechanics, and concrete engineering.

The soils division, added in 1932, has handled field and laboratory tests of soils for large earth dams and levees in the Mississippi Valley, the design of flood-control works, and foundation investigations for concrete dams and outlet structures.

One of the more important jobs done by the station was in 1952, when the Missouri Valley was hit by a flood. Rainfall and runoff data were quickly telephoned to the station's suboffice near Jackson, Miss., where flood conditions were simulated on a 200-acre model—the largest of its kind in the world—of the Mississippi basin. With information obtained from the model, the station predicted accurately and a week in advance the time and occurrence of the flood crest along the levee and the parts of the valley which would be flooded. Basing their operations on this data, field engineers concentrated flood fighting at critical points, to prevent an additional $65 million damage to points along the river.

Linbeck DECALS for TRUCK DOORS

COASTAL LINE CONSTRUCTION CO. INC. ELECTRICAL CONTRACTORS

TORGERSEN BROTHERS GENERAL CONTRACTORS

LESS THAN 2¢ PER SET

✓ FINEST QUALITY
✓ PERSONALIZED DESIGN
✓ 10 DAY DELIVERY

FOR SKETCHES and SAMPLES WRITE TO...

STORER DECAL CO.
1558 SO. MARKET
WICHITA, KANSAS

Dike Removal—Two Caterpillar D7's push and pull a LaPlant-Choate scraper as they demolish a gravel dike on the Wisconsin River. This part of the work on the steam generating plant built for Wisconsin Public Service Corp., Milwaukee, Wis., was subcontracted to William Bowersock, Stevens Point, Wis.

Thruway Approaches—An International TD-24 crawler tractor—pulling a Euclid loader which loads out eight Euclid bottom-dumps—works in one of the borrow pits that supplied fill for approach roads built on a section of the New York State Thruway by D. W. Winkelman Co., Syracuse, N. Y.

Reinforced-Concrete Homes Planned for Puerto Rico

Construction is scheduled to begin shortly on the first 300 units of a $10,000,000 low-cost reinforced-concrete housing development in San Juan, Puerto Rico, which will contain up to 2,000 single-family homes on a 205-acre tract.

Actual construction will be carried out by the Las Lomas Development Corp., which is being organized by the Corbetta Construction Co., New York, N. Y.; Rexach & Rivera Construction Co., Puerto Rico, and Ibec Housing Corp., an affiliate of the International Basic Economy Corp., of which Roger H. Corbetta is vice president and director.

The project, to be known as Villa Las Lomas, will help relieve the island's housing shortage in the low-priced range for about eight to ten thousand people. Located near employment centers in the city, the development will contain two and three-bedroom houses with varied floor plans and color schemes. Units will be of modern design to permit easy expansion, and will be priced from $4,900 to $5,900. The dwellings are being located to take advantage of the prevailing trade winds for maximum coolness, and will have louvered windows and wall vents beneath the roof for through cross ventilation. The entire tract will be a completely integrated community containing commercial and recreational facilities.

The work is being sponsored by the Commonwealth Development Corp. of Puerto Rico, organized by the Corbetta and Rexach & Rivera organizations.

Remember the Blood Bank Today!

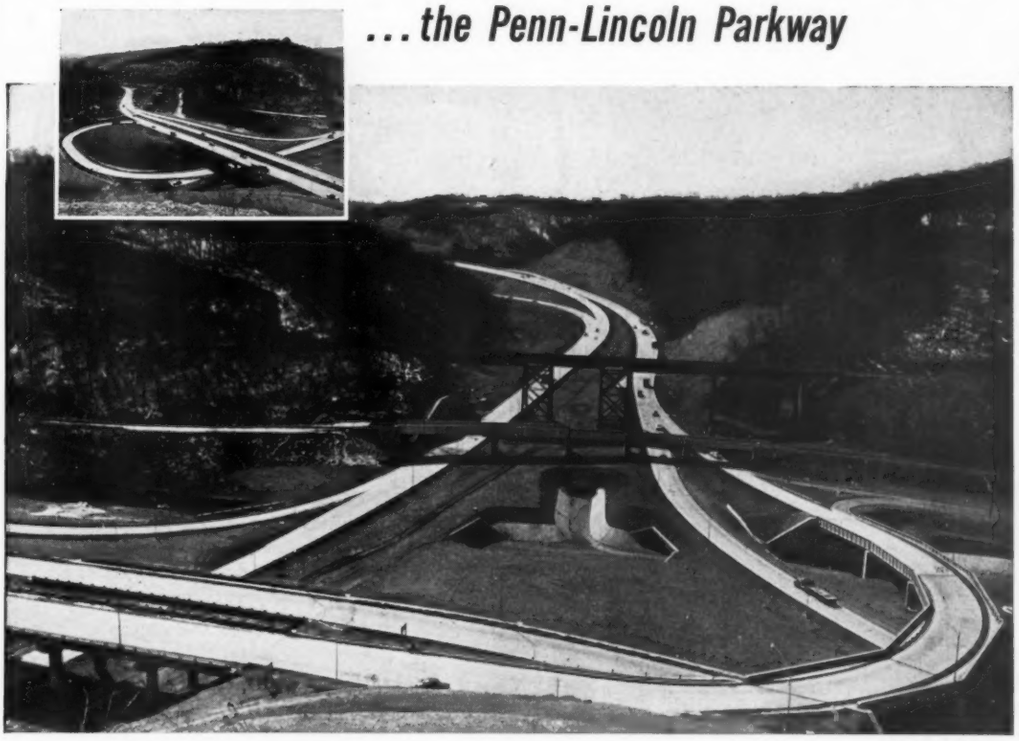
Invest In

U. S. DEFENSE BONDS

Now Even Better

Smooth...from overpass to underpass

...the Penn-Lincoln Parkway



Penn-Lincoln Parkway

FLEXCELL* JOINT FILLER ASSURES TIGHTER, SMOOTHER, MAINTENANCE-FREE EXPANSION JOINTS ON SAW MILL RUN INTERCHANGE

Bulging, bumpy joints, gaping crevices, costly maintenance—these are troublesome problems *solved* wherever concrete meets concrete . . . by Flexcell Bituminous Fiber Expansion Joint Filler.

The secret lies in Flexcell Joint Filler's durable, tough, resilient cane fiber base. Its millions of tiny air cells let Flexcell absorb pressure without extruding, as concrete expands. When concrete contracts, Flexcell springs back to normal, keeping joint neatly and smoothly closed.

Easy to handle and needing no maintenance, Flexcell Joint Filler provides neat, finished joints without trimming. Impregnated with asphalt to resist moisture. Withstands toughest service, severest weather conditions. Protected against dry rot and termites by the patented Ferox® Process. And yet, Flexcell is still *low in both initial and installed cost.*

Leading engineers, contractors, and architects have long specified Flexcell Joint Filler; so have United States Army, Navy, and other Federal, State, and Municipal agencies. Before starting your next job, *you, too,* should consider the many advantages of Flexcell.

Mail the coupon below for full details on the benefits and economies in using Flexcell Joint Filler for pavements, runways, sidewalks, curbs, gutters, driveways, concrete floors. No cost or obligation.

Another Famous CELOTEX *Product*

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BITUMINOUS FIBER EXPANSION JOINT FILLER

The Celotex Corporation, 120 S. LaSalle Street, Chicago 3, Illinois

*Flexcell is a Trademark identifying Bituminous Fiber Expansion Joint Filler marketed by The Celotex Corporation.

MAIL THIS COUPON

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120 S. LaSalle St., Chicago 3, Ill.

Without obligation, please send me complete data and prices on Flexcell Bituminous Fiber Expansion Joint Filler.

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Address_____

City_____ Zone____ State_____

CONSTRUCTION CAMERA

Turnpike Drainage—Working on the 88-mile West Virginia Turnpike, one of the Gradalls owned by Latrobe Road Construction Co., Latrobe, Pa., digs a drainage trench and loads into a Euclid. Representing one of the toughest turnpike excavating jobs to date, the turnpike runs from Charleston to Princeton, near the Virginia border. Latrobe's contract included 26,000 feet of drain pipe and culvert; the entire job calls for 915,275 yards of channel excavation and nearly 31 miles of corrugated metal pipe and concrete culvert. Above, Nello L. Teer Co., Durham, N. C., places 24-inch drainage pipe with another Gradall.

FOR SOIL COMPACTION IN RESTRICTED AREAS!

CALIFORNIA HOSPITAL—Ability to work inside buildings and in other restricted areas makes the Barco Rammer invaluable. The job pictured above is on the Peninsula Hospital near Millbrae, California. *Contractors:* Williams & Burrows and Carl N. Swenson Company. (*Photo:* CONSTRUCTION ILLUSTRATED.)

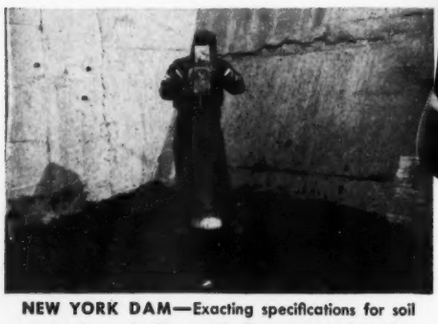
BARCO *is the Answer!*

GEORGIA HOUSING PROJECT—With Barco Rammers, you can finish fill to high degree compaction immediately for quicker completions and important savings in cost. This is why the J. A. Jones Construction Co. used seven Barco Rammers on the Lakewood Housing Project at Atlanta, Georgia. (*Photo:* DIXIE CONTRACTOR.)

SOIL COMPACTION is the key to *better construction* on important building projects throughout the country—and on these jobs, BARCO IS THE ANSWER! Time after time, it has been proven that no other type of equipment can match BARCO PERFORMANCE.

The Barco Rammer is a completely self-contained unit; no auxiliary or extra equipment is required. On area tamping, where specifications call for 95% to 97.5% (modified Proctor) compaction, one man can average 20 to 30 cubic yards of fill per hour, day after day.

If you are not already using the Barco Rammer for soil compaction work, find out about it now! *Worldwide Sales and Service.* BARCO MANUFACTURING COMPANY, 518H Hough St., Barrington, Illinois. (*Near Chicago*).



NEW YORK DAM—Exacting specifications for soil compaction on the Downesville Dam project of the New York City Board of Water Supply were easily met by Barco Rammers used by Carlo Bianchi & Company. (*Photo:* CONSTRUCTIONEER.)

BARCO
"Pegson" Gasoline
RAMMER
For Soil Compaction Close to Walls, Culverts and Abutments — in Trenches, Ditches

FREE ENTERPRISE—THE CORNERSTONE OF AMERICAN PROSPERITY

Portable Water Tank Has Cup Dispenser

■ A new insulated portable water tank is offered by the Dixie Cup Co., 24th St. and Dixie Ave., Easton, Pa. The Dixie portable water tank carries drinking water directly to the workers so that they do not have to leave their jobs.

This new tank keeps water cold and fresh for hours, even in hot humid climates. It comes equipped with carrying straps. An automatic shut-off spigot is recessed into the side wall of the tank.

Each tank is also equipped with a Dixie cup dispenser and a disposal unit for used cups. With the cup dispenser attached to the tank, workers can drink from a clean cup every time, avoiding the possibility of cross infection.

For further information write to the company, or use the Request Card that is bound in at page 18. Circle No. 696.

McDiarmaid Is President Of Vermiculite Institute

The Vermiculite Institute of Chicago elected L. G. McDiarmaid president of the organization at its annual meeting in Coronado, Calif. Mr. McDiarmaid is vice president of Insulation Industries, Vancouver, B. C.

W. J. Bein and E. R. Murphy were re-elected treasurer and managing director of the institute, respectively, and H. W. Steiff was named to the organization's board of directors.

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Steelwork Looks Up—Because of heavy river traffic, steel erection for the Boston-Chelsea Bridge is done with the leafs of the twin bascule span in a vertical position. American Bridge Co., usually a steel subcontractor, is prime contractor, and Coleman Bros. Corp., Boston, Mass., subcontractor for concrete and deck. *Jim Connolly Photo*

Plateau Yields Material—Working next to its source of supply, this portable Universal Junior Pacemaker crusher takes material from a plateau and converts it into road-tons mix and construction material at the rate of 800 tons per day. The unit, owned by Earl E. Games, Reno, Nev., is powered by a 6-71 General Motors diesel.

Diesel Generating Set

■ The addition of another new model to its line of diesel-powered generating sets is announced by the R. H. Sheppard Co., Inc., 47 Middle St., Hanover, Pa. The new model is a completely self-contained unit consisting of a Model 16 4-cylinder Sheppard full-diesel engine coupled with a 20, 25, or 30-kw generator. The unit is available either self-regulated or with external voltage regulation.

The Model 16 Sheppard diesel used to power the new unit has a compression ratio of 22 to 1. It features a full-flow-filtration lubrication system, which passes all lubricating oil through the filter before it reaches the bearings.

For further information write to the company, or use the Request Card at page 18. Circle No. 733.

Bulletin on Steam Cleaner

■ A bulletin on its new steam cleaner is offered by the Turbo Machine Co., Lansdale, Pa. The Spontane unit converts cold water to 80 psi steam in 45 seconds. A preheating arrangement, called Hydro-Therm Flow, is featured.

The portable equipment operates at 80 to 125 psi steam, independent of city water pressure. It has automatic ignition, and water level and pressure control.

To obtain this literature write to the company, or use the Request Card that is bound in at page 18. Circle No. 815.

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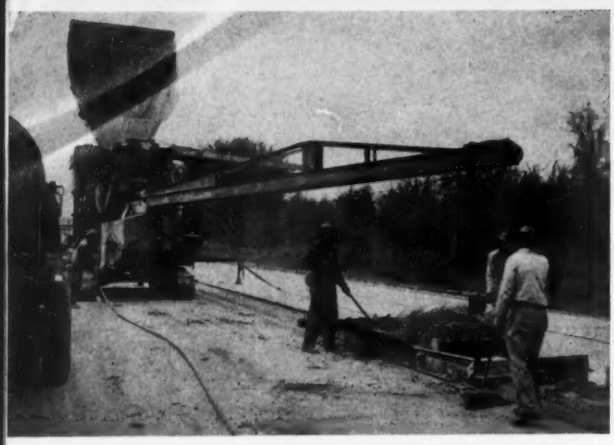

A Koehring 34-E paver, operating from the old slab, pulls the spreader box which roughly shapes the median. The box, consisting of a shoe with an opening in the top, holds half a 36-foot batch of concrete. *C&E Staff Photos*

Lumber Carrier Is Used In Paving Median Strip

To put the finishing touches on 7 miles of divided concrete highway between Erwinville and Livonia, La., T. L. James Co., Inc., Ruston, La., built a concrete median with equipment designed and previously used to construct articulated mattresses for levee protection. With a shop-made spreader towed by a Koehring paver, and a converted Hyster lumber carrier equipped as a finishing machine, crews completed ⅔ mile of the 4-foot-wide raised median in an average day. Eventually, crews placed 5,480 linear feet in a 10-hour day.

This work was done on the new roadway built on U. S. 190 just west of Baton Rouge late last year. The old roadway, a concrete pavement built nearly 20 years ago, is still in serviceable condition. The new 2-lane concrete slab was placed by W. R. Aldrich & Co., Baton Rouge, La., during the fall and winter of 1953 as a continuation of the program providing a divided highway between Baton Rouge and Erwinville. Work on the median was started on December 10, 1953, and the seven-mile stretch was completed this February, despite frequent delays caused by bad weather.

Grader Cuts Trench

Starting the work, a Caterpillar 12 motor grader, with a special plow attached to its blade, cut out a trench between the two roadways. Guides, riding the pavement on both sides, maintained the cut uniformly 2 inches below the tops of the slabs. At intersections and crossings, the trench was deepened to a minimum of 6 inches. Excavated material was bladed to the outside shoulder.

Sides of the median slope upward from the tops of the paving slabs at an angle of 45 degrees. The top surface is finished practically flat. The section is 6 inches deep and projects 4 inches above the finished pavement. At crossovers and intersec-

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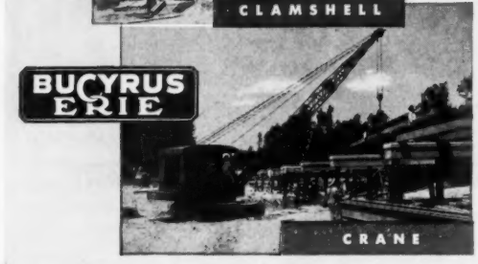

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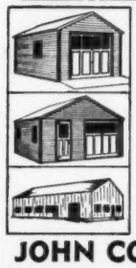

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Converted machine is equipped as finishing device for work on raised concrete highway divider

Cement for the median is unloaded from a 100-barrel Gramm hopper-bottom trailer into a Blaw-Knox batch plant. The plant, equipped with twin-batch scale hoppers, is capable of weighing two batches simultaneously.

tions, the raised portion is finished with rounded ends, and a flat slab, level with the pavement, is carried through the crossing.

Concrete was batched from a Blaw-Knox plant which W. R. Aldrich & Co. had used for the paving. A 100-ton, 2-compartment aggregate bin was fitted with Blaw-Knox twin-batch scale hoppers. A crane with an Owen 1¼-yard clamshell bucket unloaded aggregate cars and charged the bins.

Cement was loaded from a separate plant having a capacity of 550 barrels in two bins. Cement from the Ideal Cement Co., Baton Rouge, was hauled to the job in three truck-trailers. Two of these were Gramm hopper-bottom trailers with a capacity of 100 barrels. The third was a Baughman self-unloading trailer. International R-170 trucks with tandem rear axles pulled the trailers. Aldrich delivered the materials to the mixer in the batch trucks which had been used on the paving job.

Water for mixing was pumped from a bayou at the west end of the job and hauled to the mixer in two tank trucks with capacities of 1,500 and 2,000 gallons, respectively. Two pumps, a Rex and a Gorman-Rupp, raised the water to two 500-gallon storage tanks mounted on a high platform on the bridge crossing the bayou. Trucks were filled quickly from these tanks by gravity.

The Koehring 34-E paver traveled on the old paving slab adjacent to the median. From the side of the paver, a bracket made of angles extended out over the median trench. A chain attached to the end of the bracket towed the spreader box, which struck off the concrete to the approximate shape of the finished section.

The spreader box consisted essentially of a shoe, 18 feet long, which had the shape of the finished median. It had an opening in the top, and its hopper held approximately half of a

(*Continued on next page*)

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(Continued from preceding page)

36-foot batch of concrete. This hopper carried the surplus as the strike-off at the rear of the spreader shaped the top of the island. The paver first dumped concrete in the trench, then pulled the spreader along, leaving the proper amount of concrete in a roughly finished shape.

Finishing Machine

Following a short distance behind the spreader, the finishing machine completed the median. This machine consisted of a Hyster lumber carrier, remodeled to increase both its width and height by 12 inches. A Winpower generator, mounted on the upper frame of the carrier and driven by a V-belt drive from the Hyster engine, provided electrical power for operating vibrators and finishers. To reduce traveling speed of the carrier to a range of from 500 feet per hour to 10 miles per hour, a second transmission was added.

The finishing device was suspended under the carrier on the power lift so that the operator could raise or lower the entire assembly at will. The finisher consisted of a long shoe, the shape of the finished median, fitted with a Master electric vibrator, a motor-driven belt finisher, and two motor-driven finishing paddles. In making articulated mattresses, all this equipment was used, but on this job, the belt and finishing paddles were unnecessary.

As the finisner traveled along, the vibrator on the front of the shoe compacted the mix, leaving a slight void at the top. To fill this void, mortar was added by hand through an opening in the top of the shoe. As the rear of the shoe passed over the section, the mortar was spread uniformly over the surface to produce a smooth finish which required only a slight hand finishing.

Mortar added in the finisher was mixed by the paver. A mortar batch consisted of the regular 36-foot batch less the coarse aggregate. When a batch was mixed, it was dumped into a large mortar box which was towed by the tank truck supplying water to the mixer. Mortar was shoveled from the box into buggies and wheeled to the finisher as needed.

Expansion joints of ¾ x 6-inch Celotex were placed in the median at 45-foot intervals. The joints, set up in advance of concrete placement, were held firm by hooked rods driven into the base. After the machines had passed, these joints were edged and finished by hand. Edges of the concrete slabs were painted with asphaltic paint to minimize adhesion between the pavements and the median.

Hunt Process curing compound was applied to the surface to retain water for curing. A Hunt spray machine pumped the material directly from 55-gallon drums to the hand-held nozzle. The spray machine and material barrel were mounted on a skid which could be conveniently towed by any truck or pickup. A long hose permitted the operator to work about 100 feet each way from a setting.

Two-way traffic was carried through the job at all times on the new roadway, since all job operations were conducted from the old roadway. Trafficone warning devices were strung along the median for long distances to keep motorists from getting too close to the newly-placed concrete.

Personnel

Supervising the job for T. L. James Co., Inc., was Howard B. Smith. Superintendent for W. R. Aldrich & Co. was Harold Holland. The project was constructed under supervision of the Port Allen District of the Louisiana Department of Highways; W. J. Hughes is district engineer. Project engineer was E. F. Oakley, and H. D. Coffee was chief inspector. R. H. Vaughan is maintenance and construction engineer of the Louisiana Highway Department.

THE END

Booklet on Attachments For Graders and Tractors

■ Attachments for Caterpillar motor graders and wheel and track-type tractors are shown in a folder from the Caterpillar Tractor Co., Peoria 8, Ill. Those covered in some detail are enclosed cabs, hot-water heaters, lighting systems, and track-roller guards. The back page of the booklet furnishes a partial listing of additional attachments available, including steering boosters, power take-offs, and starting engines.

To obtain this literature write to the company, or use the Request Card that is bound in at page 18. Circle No. 776.

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Forms illustrated on this page are (top) the Heltzel Standard Road and Airport Form, and (bottom) one of several styles of the popular Heltzel Dual-Duty Form that combines two standard paving heights in a single form, with or without dowel installing feature.

*Also available without flange.

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The new Pioneer Model No. 310 screening and loading plant is designed to be moved quickly.

Portable Screening And Loading Plant

■ A portable screening and loading plant for roadside work where bins are unnecessary is now being built by the Pioneer Engineering Works, Inc., 1515 Central Ave., Minneapolis 13, Minn. The lightweight Pioneer Model 310 plant is designed specifically for the production of screened sand and gravel for jobs entailing frequent moves and requiring little auxiliary equipment.

Hinged conveyors and on-plant power on the same pneumatic-tired chassis that carries the screen and feeder make it easier to move the plant by eliminating mounting and lineup of conveyors and belts. On short moves, the feeder and feeder conveyor can be left in operating position; for longer trips the feeder and frame extension can be quickly removed and the conveyor folded back on itself.

Components of the plant include a 24G reciprocating plate feeder with 6-foot shovel hopper and trap grate; a 3 x 10-foot 2-deck 4-bearing vibrating screen; a 24-inch x 29-foot feeder conveyor; a 24-inch x 20-foot end-delivery conveyor, and an 18-inch x 15-foot side-delivery conveyor for rejecting oversize material. All these conveyors are folding channel-frame units.

Power requirement is 25 hp continuous. Wheelbase is 16 feet, feed height is 9 feet, and operating length is 43 feet 3 inches. Moving dimensions are: over-all length, 26 feet 6 inches; width, 8 feet; height, 12 feet 1 inch. Total weight is approximately 20,000 pounds with 14,000 pounds on the rear axle and 6,000 pounds on the front axle.

For further information write to the company, or use the Request Card that is bound in at page 18. Circle No. 695.

Daniel Construction Co. Names Stellmann Manager

Harry J. Stellmann has been appointed general manager of the Florida division of Daniel Construction Co., Inc., general contractor of Greenville, S. C. Mr. Stellmann is a former vice president of Starrett Bros. & Eken, Inc., New York, N. Y., and former vice president of the Building Trades Employers' Association of New York City. He will make his headquarters at 841 Miami Road, Jacksonville, Fla.

Road-Joint Devices

■ Its full range of road-joint devices for concrete highways and airstrips is presented in a bulletin from the Richmond Screw Anchor Co., Inc., 830 Liberty Ave., Brooklyn 8, N. Y. Devices shown include lightweight dowel baskets, heavy-type dowel supports and spacers, and the new short-dowel one-man-type load-transfer assembly, which is available with stainless steel dowels for special applications.

To obtain this literature write to the company, or use the Request Card that is bound in at page 18. Circle No. 795.

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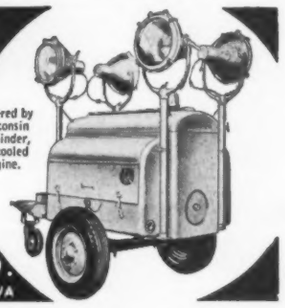

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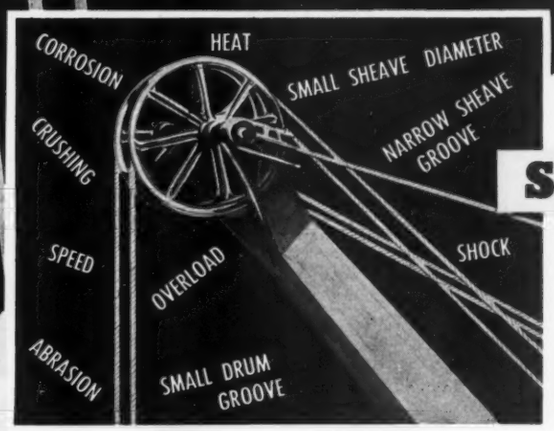

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BERGEN WIRE ROPE

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Gregg Street, Lodi, New Jersey

The new Universal Washmaster plant.

Portable Washing Plant

■ Electric push buttons control the new Universal Washmaster aggregate washing plant. The portable unit delivers up to four sizes of finished material and has a capacity of 150 to 200 tons per hour.

The plant features a 4 x 12-foot, 3-deck, inclined gyrating screen equipped with spraybars and piping and a 22-inch-diameter x 25-foot-long double fine-material screw washer. Delivery chutes permit taking material from any deck of the screen or mixing sizes to meet requirements. The feed conveyor is of 24-inch channel frame and has a basket hopper.

A 36-inch horizontal side-delivery conveyor, which travels slowly, permits hand rejection of unwanted material. It is extra wide to accept material from all three screen decks when desired. An 18-inch horizontal side-delivery conveyor discharges material from the third screen deck. Both delivery conveyors fold for traveling.

The plant is mounted on a pneumatic-tired gooseneck trailer. It may be used as a complete washing plant or it may be combined with a portable rock or gravel plant to give a crushing and washing set-up, according to the manufacturer.

For further information write to the Universal Engineering Corp., 620 C Ave. N. W., Cedar Rapids, Iowa, or use the Request Card at page 18. Circle No. 779.

Bulletin on Hose Coupling

■ A quick disconnect hose coupling for water, oil, steam, gas, and chemical lines, which features a sealing action that makes the coupling tighter as internal pressure increases, is described in a bulletin from Titeflex, Inc., 500 Frelinghuysen Ave., Newark 5, N. J. The coupling also has a full swivel to prevent hose twisting and kinking.

Also described in the bulletin are single and double check-valve modifications of this coupling, which permit the disconnecting of lines without shutting down pumps, and prevent the escape of fluids when the lines are opened. Coupling accessories, such as right-angle connections and dirt-excluding covers, are also described.

Tables give pressures at which the coupling can be used and list the materials and sizes in which it is manufactured.

To obtain this literature write to the company, or use the Request Card that is bound in at page 18. Circle No. 789.

Stabilizing Jacks For Block Handler

■ The addition of power-operated hydraulic-jack outriggers to its Magic Muscle truck-mounted concrete-block handler is announced by the Wm. Bros Boiler & Mfg. Co., 1027 Tenth Ave. S. E., Minneapolis 14, Minn. The jacks, used to add stability, are positioned on each side or at forward corners of the truck bed, depending upon the location of the boom and mast. Power to operate these jacks independently is supplied by a hydrualic power pack located in the electric generating plant compartment of the Magic Muscle unit.

The Bros Magic Muscle now permits one man to handle 700-pound block loads. It fits all truck beds from 12 to 27 feet in length. The complete unit weighs 1,000 pounds.

For further information write to the company, or use the Request Card at page 18. Circle No. 701.

Multipurpose Excavator On a Crawler Mounting

■ A folder reviewing the features of the crawler-mounted Gradall multipurpose excavator has just been issued by the Gradall Division of the Warner & Swasey Co., 5701 Carnegie Ave., Cleveland 3, Ohio. The folder tells how the crawler is driven and maneuvered with hydraulic power, describes the controls for the machine, and gives its working ranges in chart form. Typical construction applications are also illustrated.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 761.

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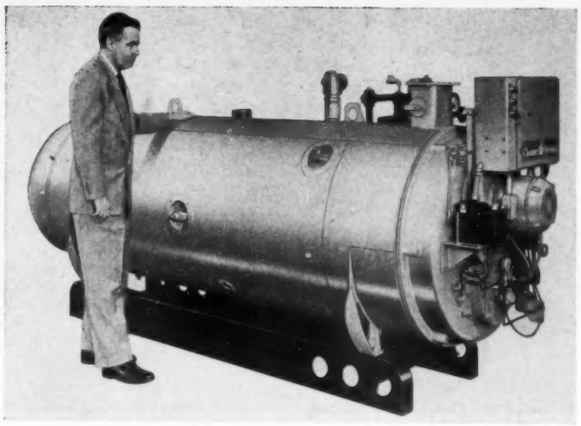
Capacities: 125, 210, 365, 600 cfm

. . . CP ROTARY COMPRESSORS

After 18 months of proving themselves on the job, CP Power Vane Rotary Compressors are now available in sizes of 125, 210, 365, and 600 cfm. Having no pistons, connecting rods, valves or other reciprocating parts to maintain, they afford thousands of hours of trouble-free service. Their oil injection system provides copious lubrication, cools the air during compression and assures long rotor blade life . . . yet oil consumption is remarkably low and air is delivered practically oil-free.

Smooth running CP Rotary Compressors al have a variable speed capacity regulator which pr longs life and reduces wear and tear . . . increas over-all economy. CP Rotaries are available wi Hercules gasoline and General Motors diesel e gines. For more information, write for Bulleti SP-3084-2. *Chicago Pneumatic Tool Compan 8 East 44th Street, New York 17, N. Y.*



The new Cleaver-Brooks Model CB boiler.

Improved Boiler Unit Has Construction Uses

■ A new compact boiler unit has been announced by the Cleaver-Brooks Co., 326 E. Keefe Ave., Milwaukee 12, Wis. The new CB boiler has a variety of applications in the heavy construction field. It will supply hot water for central mixing plants, concrete block plants, or other large-volume hot water needs.

It makes steam to thaw and heat aggregate for winter concreting, as well as for heating buildings and offices.

One of the advantages of the new unit is silent operation. Like other Cleaver-Brooks boilers, the new model burns gas or oil and can be converted from one fuel to the other in less than a minute. The new boiler burns light oils without the difficulties often experienced with gun-type burners.

Standard equipment on the unit includes the Fireye electronic-combustion safety control. Accessibility for operation and maintenance is increased by the use of hinged doors on the front and rear of the unit.

This new model, now available in sizes of from 15 to 40 hp, will be available in 50 to 80-hp sizes shortly.

For further information write to the company, or use the Request Card at page 18. Circle No. 811.

Torque Converters For Low-Power Engines

■ Torque converters meeting the requirements of heavy-duty operation now are available for application in the lower power ranges, through the development of a new series of Allison Torqmatic drives. The new converters, designated as the TC-200 and TC-300 series, can be used with either gasoline or diesel engines in the 40 to 150-hp range. They have application in equipment such as rollers, cranes, shovels, loaders, tractors, and ditchers. With the new series, Allison Torqmatic drives are now available for gasoline and diesel engines in the 40 to 400-hp range.

The unit is designed for simplified flexible installation because the oil system, charging oil pump, oil cooler, oil sump, and gear drive are integral with the converter. Installation can be made on any SAE standard power-takeoff flywheel. Also available with the basic converter is a wide variety of equipment including front-disconnect clutches and adapters, rear-disconnect clutch adapters, automotive-type flanges, industrial shafts, and governor drives.

For further information write to the Allison Division of the General Motors Corp., Box 894, Indianapolis 6, Ind., or use the Request Card at page 18. Circle No. 792.

Motor Scrapers, Wagons

■ Mechanical and performance features of the Allis-Chalmers Models TS-200 and TS-300 motor scrapers, and of motor wagon Models TR-200 and TW-300, are described in detail in two new catalogs now available from the company.

Catalog views of the equipment are included along with photos showing important mechanical features of the models. In addition to giving specifications and other important data, the catalogs are illustrated with in-the-field photographs.

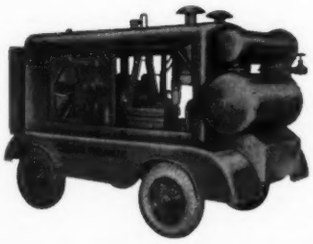
To obtain this literature write to Allis-Chalmers Mfg. Co., Milwaukee 1, Wis., or use the Request Card at page 18. Circle No. 724.

Folder on Crane Carrier

■ A new folder illustrating the one-man-type Cook crane carrier is available. The big feature of this carrier is the independent power supply which permits independent travel and swing. The folder covers the unit's operation and uses and includes an outline of the carrier's basic components and dimensions.

To obtain this literature write to the Cook Bros. Equipment Co., 3334 San Fernando Road, Los Angeles 65, Calif., or use the Request Card at page 18. Circle No. 704.

THAN PISTON TYPES OF HALF THE CAPACITY...



Three ways better...

1 **Tapered roller main bearings** afford positive positioning of rotor between compressor cylinder end plates.

2 **Safety friction drive** between engine and compressor limits transmitted torque — provides added protection for engine and compressor against shock.

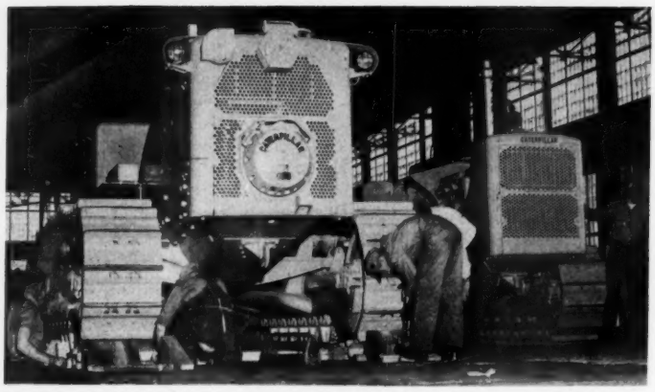
3 **Perfect alignment of all parts** is afforded by metal-to-metal joining of housings and fitted-step construction of mating surfaces and shaft-mounted parts.

IDEAL WHERE **PORTABILITY** AND **RELIABILITY** COUNT!

- CP Portable Power Vane Rotary Compressors occupy 30% less space than equivalent piston type machines.
- Compressor weighs less, is more compact than piston type machines of half the capacity.
- Due to oil injection, discharge air is 100° lower than in equivalent piston type compressors.
- Spring suspension, automotive steering on four wheel models, tilt operation, compactness and light weight make CP Rotary Compressors ideal for towing and maneuvering anywhere.
- Rotary shaft seal at drive end excludes dirt from shaft bearings.
- Automatic safety controls stop engine in case of excessive water temperature or oil failure.

Chicago Pneumatic 8 East 44th Street, New York 17, N. Y.

PNEUMATIC TOOLS • AIR COMPRESSORS • ELECTRIC TOOLS • DIESEL ENGINES • ROCK DRILLS • HYDRAULIC TOOLS • VACUUM PUMPS • AVIATION ACCESSORIES



Experimental Tractor—Now undergoing tests is the largest and most powerful Caterpillar crawler tractor ever built, the D8X. The unit, dwarfing the Cat D8 at right, is 18 feet long, 12 feet wide, 10 feet high, and weighs 51,500 pounds plus 11,000 pounds for the blade and cable controls. For details on the company's present models circle 774 on card at page 18, or write to the Caterpillar Tractor Co., Peoria 8, Ill.

Service Station on Wheels—The complete lubrication service that a truck-mounted field lubricator can provide has made such units common sights on construction jobs. Smaller contractors hire independent operators owning units like this Graco Convoy Luber to do the job. For details circle No. 771 on card at page 18, or write to the Gray Co., Inc., Graco Square, Minneapolis 13, Minn.

THE UNBEATABLE COMBINATION FOR *Profit!*

IT'S YOURS IN THE Cedarapids Built by IOWA

SUPER TANDEM

ASK Super Tandem owners about Super Tandem performance! One contractor produced 3/4" minus material at a rate of 228 to 310 tons per hour with average percent of crush 20%. On this job, maintenance costs on the Super Tandem were less than three-fourths of a cent per yard! Figure out what this kind of low-cost production will mean on *your* jobs!

The Cedarapids Super Tandem is newly engineered for the extra high screening capacity that gives you a big advantage in any pit and is especially profitable where there is a high percent of fines or contaminated material.

Look over the features listed at the right, then ask your Cedarapids distributor to show you how you can apply them to your work for higher profits.

IOWA MANUFACTURING COMPANY
Cedar Rapids, Iowa, U. S. A.

CHECK THESE FEATURES

- √ Big 48" x 12' 2½ Deck Horizontal Vibrating Screen assures really high screening capacity, particularly desirable where gradation of a big volume of material is necessary.
- √ 2416 Roll Crusher and 1036 Jaw Crusher deliver a steady flow of crushed material.
- √ Flexibility with optional Swivel Feed Conveyor, Spray Bar attachments and Sand Ejector Screw to meet every job condition.
- √ Delivery conveyors, plant conveyor and under-crusher conveyor are 30" wide to handle the increased screening capacity of the plant.
- √ Quality construction of every unit cuts maintenance costs to the minimum, keeps plants operating all day every day to maintain your high production averages.

Master Bituminous Mixing Plant

Vibratory Soil Compactor

Motorized Head Pulley

Model G-60 6000-lb. Bituminous Mixing Plant

Agglomerated Fluxes For Submerged Arc Welding

■ New developments in fluxes for automatic welding and hard-surfacing are discussed in a reprint of a technical paper prepared by L. K. Stringham, chief engineer, Lincoln Electric Co., P. O. Box 5758, 2201 St. Clair Ave., Cleveland, Ohio. The paper, originally delivered before the American Welding Society, covers the advantages of mixing properly formulated finely ground particles of flux ingredients with a proper binder and drying the resultant agglomerate. The agglomerate is then ground to the desired size for submerged arc welding. By the use of agglomerated flux, the addition of a deoxidizer and an alloy in the weld deposit through the flux is made possible.

The paper describes applications in hard-surfacing in which mild steel electrodes are commonly used in conjunction with alloys of carbon, chromium, molybdenum, and vanadium. The addition of alloy is made according to the job requirements, which may call for a wear-resistant deposit that can be machined after welding as in the case of shafts and rolls. Another type of application described is that used on crawler tractor idler rolls where machining is unnecessary, but where a smooth and tough deposit is needed. The paper also treats in some detail a new application in which the bottoms of some large mixers are being surfaced.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 799.

Sign up before it happens! Civil Defense needs you for wardens, police, and first aid.

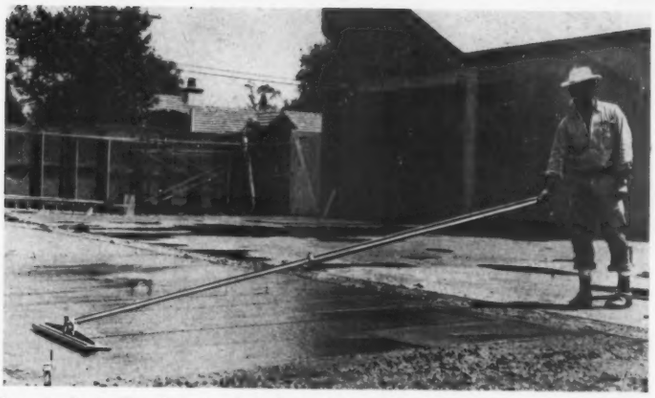
The Indispensable
DISPENSER

New Dispenser for Air Entraining Agents and Calcium Chloride

Write for New Folder

J-W MATERIALS, INC.
P. O. Box 288, Napoleon, Ohio

Side-Dump Loader—Dumping to the side as well as forward, this Isaken bucket for Baker-Lull hydraulic loaders works efficiently by reducing the need for jockeying. The loader is also interchangeable with ¾ and 1¼-yard buckets now in use on Case, Minneapolis-Moline, and Oliver tractors. For details circle 767 on card at page 18, or write to the Baker-Lull Corp., 922 W. 90th St., Minneapolis, Minn.



Concrete Tool—The Grier Levelaid Cementool, made of magnesium alloys, is a lightweight cement-finishing tool that can be used in close and extended quarters as a float, a fresno, a grade lute, and extension handle for a finish broom. The smallest Levelaid extends from 6 to 12 feet and weighs 5 pounds. For details circle 770 on card at page 18, or write Kay M. Grier Engineering Corp., 11525 Tuxford St., Sun Valley, Calif.

Improvements in Paver Increase Laying Width

■ A right and a left screed with stub axle extensions are available as accessories for the True-Lay Paver, made by the Doug-Lynn Mfg. Co., 339 15th St., Oakland 12, Calif. This makes it possible to extend the width laid by the standard 8-foot paver up to 10 feet. By the addition of baffle plates, the width may be cut to 4 feet. The accessories may be attached with an open-end wrench in a few minutes.

A second axle anchor has also been added so that the wheel will ride on the curb when paving is being done close to the curbing.

For further information write to the company, or use the Request Card at page 18. Circle No. 793.

Booklet on Jaw Crushers And Primary Plants

■ Its line of overhead eccentric jaw crushers and its Series 170 stationary primary plants are described in new literature from Pioneer Engineering Works, Inc., 1515 Central Ave., Minneapolis 13, Minn. The booklet lists the advantages of overhead eccentric jaw crushers and describes their principle and design, construction features, parts, operation, and application. Also covered in detail are suggestions on how to select the proper size crusher and how to order.

The Series 170 of five stationary primary plants, consisting of skid-mounted feeder and jaw crusher installation, is covered by photographs, drawings, and tables.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 786.

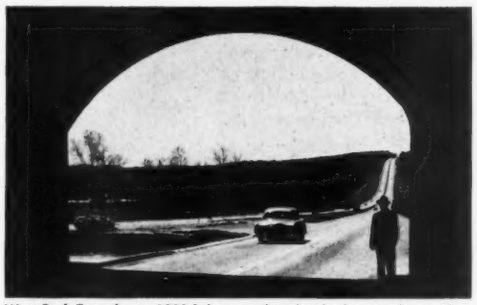
Rolatape
CALIBRATED
Measuring
WHEELS

Measures and records total as it rolls. One man with Rolatape DISTOMETER can measure horizontal, vertical, overhead, curved surfaces—line to line and wall to wall—easily and accurately.

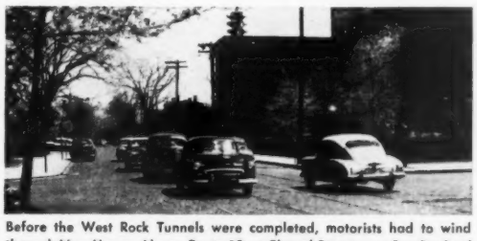
Write for full details
ROLATAPE, INC.
1741 14th Street
P. O. Box 1191
Santa Monica, Calif.

Wilbur Cross Parkway at south end of West Rock's twin-bore tunnel. Highway continues on north side of mountain. Two 24-foot concrete roadways are divided by a grassy median strip. Twelve traffic interchanges permit a free flow of traffic on and off the Parkway. Grade crossings have been eliminated by 19 overpass bridges and 19 underpass bridges.

Parkway Tunnels Help Motorists Escape New Haven Traffic Tangle



West Rock Tunnels are 1200-ft long, and each tube has two lanes. They are equipped with automatic ventilators, traffic control signals, and an elaborate lighting system that matches at all hours the day or night conditions outside the tunnel.



Before the West Rock Tunnels were completed, motorists had to wind through New Haven. Above, Route 10 on Chapel Street near San Raphael Hospital. During rush periods the Parkway saves an hour's driving time.

A few years ago, a trip between New York City and New England inevitably included a bout with New Haven's heavy traffic.

Today, thanks to the West Rock Tunnels, drivers can avoid the New Haven bottleneck and enjoy the Wilbur Cross Parkway's full 29 miles. Named for a former governor, the Parkway rolls northeastward from the Housatonic River Bridge at Milford to the Berlin Turnpike at Meriden.

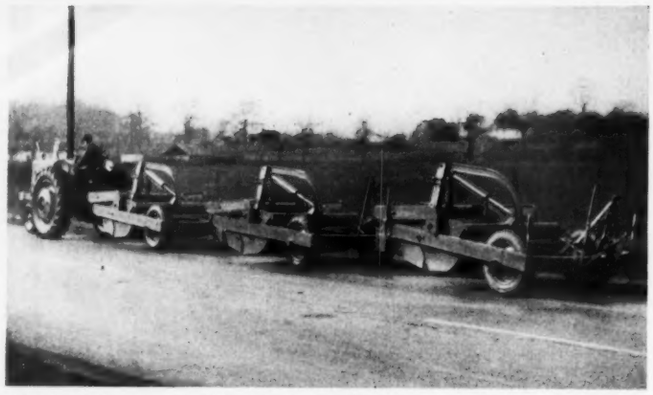
Estimated cost of the Wilbur Cross Parkway was $17,500,000. Bethlehem furnished steel for the highway, bridges and tunnels.

BETHLEHEM STEEL

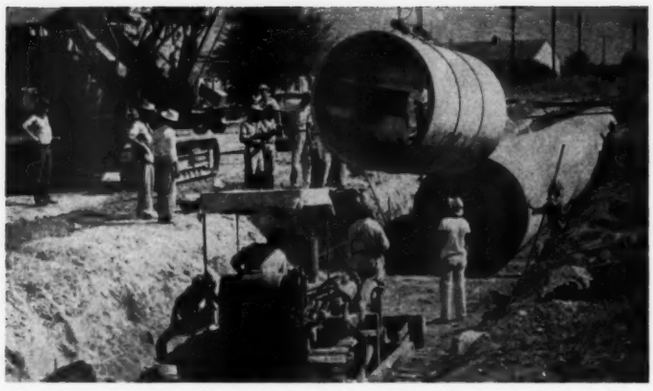
BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM STEEL



Multiple Earthmovers—Loading each unit separately, a 40-hp tractor handles several Gledhill scrapers coupled in tandem by a simple hitch. Hydraulically controlled from the tractor, the scrapers are added or dropped easily. Hauling capacity can equal that of a large self-powered unit. For details circle 772 on card at page 18, or write to the Gledhill Road Machinery Co., Galion, Ohio.



Rubber Couplings—The 72-inch concrete pipe in this installation is joined with Tylox rubber couplings, which are reported to give a tight, flexible, and durable joint. The gaskets permit fast coupling and immediate backfilling since there is no waiting period while the joint hardens. For details circle 773 on card at page 18, or write to the Hamilton Kent Mfg. Co., 427 W. Grant St., Kent, Ohio.

Fastener Selector For Powder-Actuated Tools

■ A pocket-size selector which tells at a glance the proper fasteners, disks, and charges to be used with powder-actuated tools on particular jobs is available from the Ramset Fasteners Division, Olin Industries, Inc., 12117 Berea Road, Cleveland 11, Ohio.

The selector, made of laminated cardboard, is designed so that an immediate cross-line reading can be obtained by matching a sliding-scale indicator with hardness and thickness data for each steel or concrete job. Compact reference tables also indicate the proper charge.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 777.

Promotion at Gar Wood

R. L. Schurhammer, tractor equipment service representative for Gar Wood Industries, Inc., Wayne, Mich., since 1949, has been named district manager for the company. In this capacity, he will work with Gar Wood and Allis-Chalmers dealers in Iowa, Minnesota, Montana, Nebraska, Wyoming, North and South Dakota, and the provinces of Manitoba and Saskatchewan, Canada.

Waterproof Rain Suits For Construction Crews

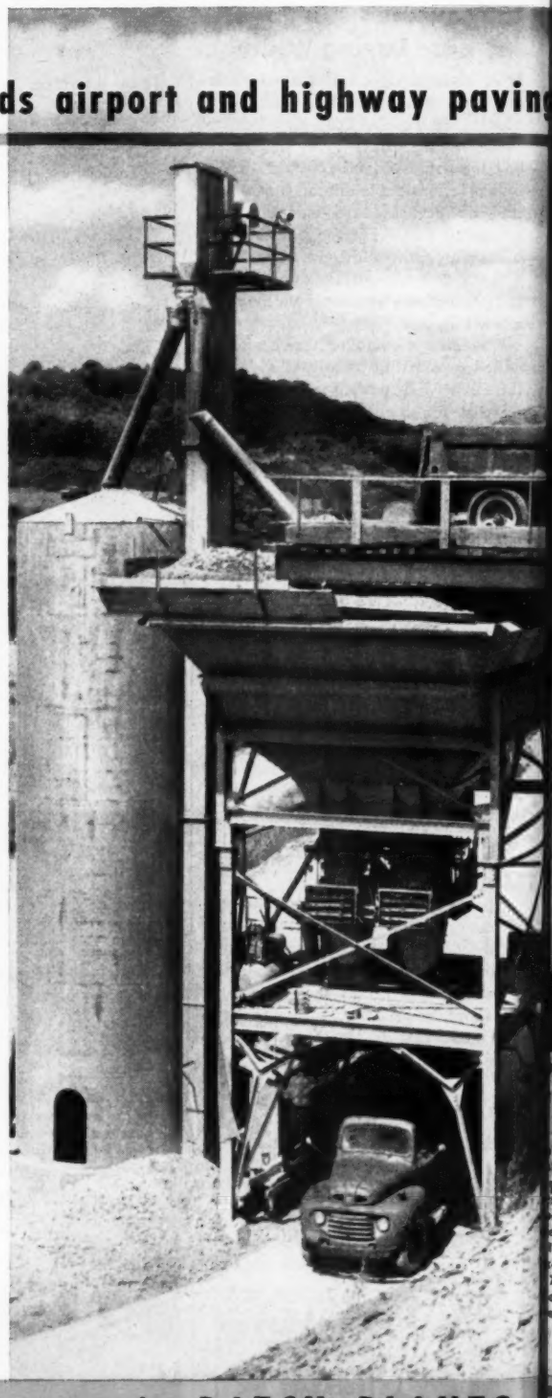
■ Rain suits and accessories for highway and construction workers are shown in literature from the John E. Dorsey Co., 80 K St., Boston 27, Mass. The Life Guard garments are made from waterproof fabric that is lightweight and flexible. The literature describes three different suits consisting of jacket, pants, and hood or parka, and it also shows overalls and accessories.

The clothing is made with a number of weatherproofing and reinforcing features. Coat seams are neoprene cemented, after being stitched for added strength, and overlaid with cloth tape. Extra elastic cuffs keep water out of rubber gloves. The detachable hood has a soft fabric lining that fits over a cap. The suits can be cleaned with soap and water.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 715.

21-SECOND batch time

speeds airport and highway pavin



Johnson Automatic Batch Plants, like the one shown here, accurately weigh out aggregates and cement ahead of heaviest paving schedules on highways, airports, and other large-volume concrete jobs. For example:

Keeps two 34-E pavers busy . . . One plant, with one batcher operator, easily supplies enough materials to keep two 34-E pavers busy full time. A 1¼-cu. yd. batch is weighed up, and discharged into truck, in as little as 21 seconds. One-stop charging of batch trucks speeds production. (Plant also can be arranged for two-stop charging.)

Automatic control maintains high plant output all day . . . assures pin-point weighing accuracy of every batch. A separate, fully-automatic weigh-batcher is used for each of the aggregates, and for the cement. All materials weigh up at the same time for greatest speed. These single-material Johnson batchers operate on electro-pneumatic control . . . fill valves and discharge gates are automatic air-ram operated.

Multiple batch selections . . . For road-builder's use, dial scale with electric cut-off switch is usually used. When more than one batch size is required, single material batchers can be equipped with mix selector for 12 different mixes . . . all controlled from central operator's station. (Each of the single-material aggregate batchers can be equipped with a moisture compensating lever which automatically gives a dry weight of material being weighed.) Up to 120 mix selections are available on large Johnson batch plants for dams, and commercial ready-mix installations.

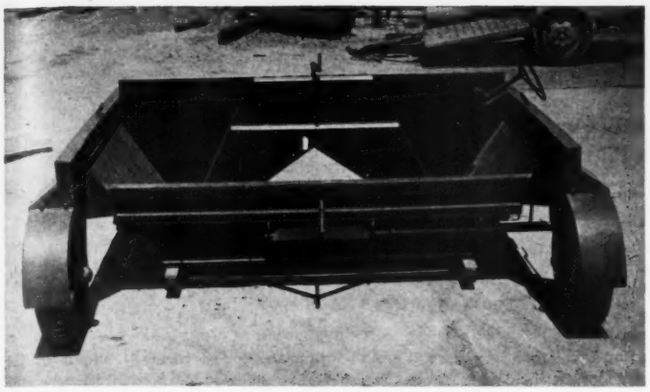
Investigate the possibilities of increasing concrete production on your operations with one of these Johnson Automatic Batch Plants. In many instances this equipment can be added to an existing plant. For complete details, contact your Johnson distributor, or write to us.

C. S. JOHNSON COMPANY

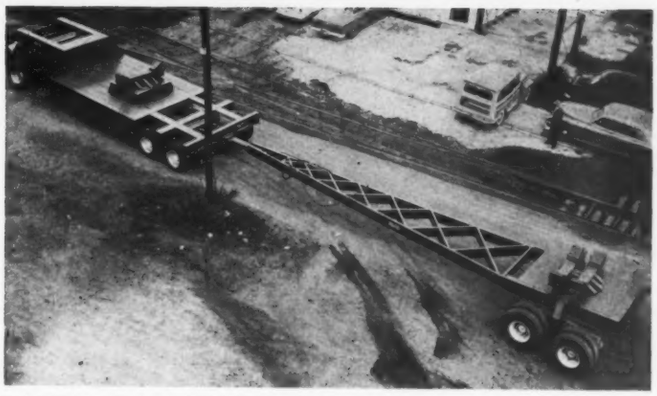
CHAMPAIGN, ILL. • (Koehring Subsidiary)

JOHNSON KOEHRING PRODUCT

JOHNSON automatic BATCH PLANTS



Windrow Spreader—The Parsons Win-Ro spreader measures out any type of aggregate in windrows. An adjustable strikeoff opening shapes windrows from 2 to 8 cubic feet per linear foot. Designed to prevent segregation of materials, the spreader measures out agggregate to specifications once it is set. For details circle 768 on card at page 18, or write to the Flaherty Equipment Co., Pocatello, Idaho.



Trailer Train—This Birmingham multiple trailer, consisting of a low-bed trailer drawbar connected to a heavy-duty dolly, is being used to haul 72-foot tubes, each weighing 200 tons. A slip joint in the drawbar lets the trailer train go around corners without the drawbar becoming detached. For details circle 769 on card at page 18, or write to the Birmingham Mfg. Co., P. O. Box 1351, Birmingham, Ala.

e-man operation
units in this Johnson Automatic
Plant consist of: 150-cu. yd.
bin, with 3 aggregate compart-
and a 150-bbl. central cement
ment. Three 2000-lb. automatic
material aggregate batchers . . .
000-lb. automatic cement batcher
receiving hopper, bucket elevator
757-bbl. aerated silo for cement,
ramp permits convenient truck
ery of aggregates to top of bin.
• BATCHERS • HOPPERS
• ELEVATORS • CHARGERS
MSHELL, CONCRETE, BUCKETS

New features on Kwik-Mix 16-S Dandie®

Latest 16-S Dandie concrete mixer, interchangeable side or end discharge, has adjustable double-contact skip shaker, automatic water system, 3-point suspension mounting on heavy coil springs, cast steel drum heads with machined roller paths. Also, exclusive remixing action, and 8-second discharge with tilted Flow-Line Chute. Other models: 3½-S, 6-S, 11-S . . . bituminous, plaster-mortar mixers, power wheelbarrows.

KWIK-MIX • Milwaukee, Wis.
(Koehring Subsidiary)

14½-ft. per-min. Parsons Trenchmobile®

Rubber-tired Trenchmobile drives job-to-job at 12.6 m.p.h. . . . digs 8 to 16 in. wide, 5 ft. deep, up to 14½ ft. per min. Sloping ladder boom makes vertical set-ins, undercuts sidewalks, curbs, old mains. Other features: hinged crumber, "Tap-In" digging teeth, reversible conveyor, optional backfill blade. Also ask your Parsons distributor about the 2 wheel-type and 3 ladder-type Trenchliners® . . . all full crawler mounted.

PARSONS Co. • Newton, Iowa
(Koehring Subsidiary)

More work-time with Koehring Dumptor®

With more than a ton of strength for every ton of payload capacity, Koehring 6-yard Dumptor withstands severest loading shocks. Sides, end and double-strength bottom are heavily rib-reinforced. Stationary or free-swinging kick-out pan adds another ½" steel plate to heavy-duty bottom. Gravity dump eliminates body hoist maintenance. 1-second dumping speeds haul cycles. Also check Dumptor fast no-turn shuttle hauling.

KOEHRING Company
Milwaukee 16, Wis.

Z65

McKiernan-Terry, Clayton Plan to Market Generator

After being tried out on the construction of a water tank foundation and a sea wall in Atlantic City, N. J., a steam generator to power pile hammers, developed by McKiernan-Terry Corp., New York, N. Y., and the Clayton Co., El Monte, Calif., is entering the production and market stages.

The steam generators will be manufactured by the Clayton Co. at its El Monte plant, and McKiernan-Terry Corp., maker of pile hammers, will market the new unit.

The generator is rated at 110 hp and features an automatic steam-cycling control which is said to reduce fuel oil costs. It is reported to have a rapid steaming capacity, and can be used for mobile and marine installations.

Improved Motor Oils

■ A new line of multi-grade motor oils said to save up to two gallons of gasoline in a tankful and to cut oil consumption by an average of 37 per cent is announced by the Standard Oil Co. (Indiana), 910 S. Michigan Ave., Chicago 80, Ill. The new oils, which are also said to minimize need for higher octane gasoline as the car grows older, are being marketed under the name of Super Permalube. They are available in three grades, each with a wide service range—SAE 5W-20, SAE 10W-30, and SAE 20W-40.

For further information write to the company, or use the Request Card at page 18. Circle No. 740.

Power Corp. of Canada, McGraw Form New Firm

The incorporation of a new Canadian engineering and construction firm, F. H. McGraw Co. of Canada, Ltd., has been announced by the Power Corp. of Canada, Ltd., and F. H. McGraw & Co. engineering and construction firm of Hartford, Conn., and New York, N. Y. Headquarters will be in Montreal.

Power Corp. holds the controlling interest in the new company. Clifford S. Strike, of Hartford, and R. J. Sharpe, of Montreal, will serve the new organization as president and vice president and general manager, respectively.

DISTRIBUTOR DOINGS

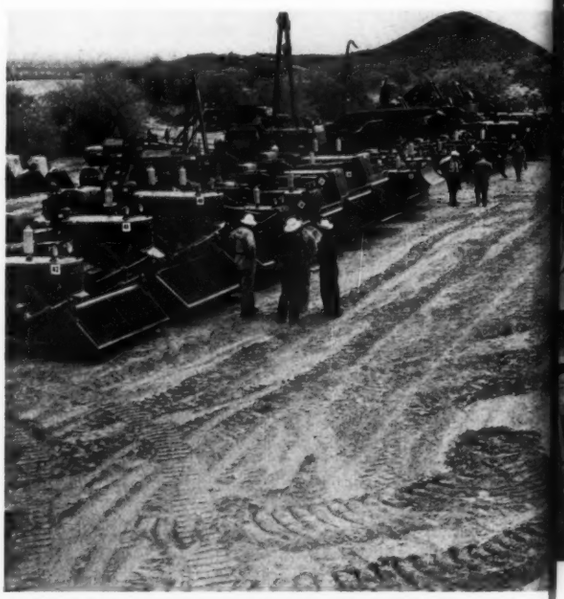
I-H Roundup for Dealers

Among equipment intoduced at the Roundup was the 200-hp torque converter TD-24 crawler tractor, which here push-loads the International 2T-75 high-speed rubber-tired tractor-scraper combination.

A NEW AND POWERFUL crawler tractor, a high-speed earthmover, and more than 75 other pieces of International Harvester machinery made the 4,200-acre Phoenix proving grounds hum with power as they went through their paces before the more than 600 distributors representing 24 nations at the International Industrial Power Roundup in Phoenix, Ariz.

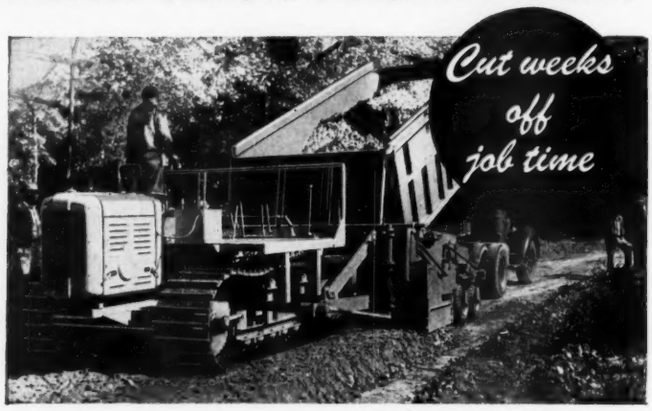
To open the huge three-day show, a parade of International's entire line of earthmoving and material-handling machines, including units produced by the Frank G. Hough Co., an I-H subsidiary, moved across the grounds, the largest single tract in the country established for testing new designs of heavy-construction equipment.

New machines making their initial appearance at the show were the fast rubber-tire earthmovers which the company recently added to its earthmoving equipment line, and the new TD-24 which, with its drawbar horsepower increased to 155, is one of the most powerful tractors marketed today. A torque-converter version of the TD-24 was also introduced. Although it has



Equipment is lined up in the corral area for a final polish prior to being paraded before the 600 dealer representatives at International's equipment Roundup in Phoenix, Ariz.

BLAW-KNOX BASE PAVERS



MODEL P-150 LAYS BASE PAVEMENT UP TO 400 TONS PER HOUR

● Base course paving is fast, accurate and economical with this high tonnage producer. You can spread stone, slag, gravel, soil cement or crusher run aggregates to depths up to 20″ and widths up to 16′ in one pass, with no separation of material. There's plenty of traction and power to push your trucks, yet flotation for the softest surfaces. Oscillating action of the V-type screed "knits" material into the voids for accurately level and smooth base courses. Operating costs are low. Hand dressing behind the unit is reduced to the minimum. Blaw-Knox Apsco Base Pavers are available in two models to meet every base pavement requirement. Write for complete details in Bulletins 2457 and 2459.

BLAW-KNOX APSCO ROAD WIDENERS

These heavy-duty time and labor saving units handle concrete *without forms*, asphaltic concrete and any kind of aggregate. They spread and finish concrete up to 1½ miles per day . . . build earth shoulders at the rate of 200 tons per hour. Two sizes available to meet your needs. Send for Bulletin 2458.

Ask your BLAW-KNOX DISTRIBUTOR
about the *"Complete Packages"* of Concrete Paving
and Ready-Mixed Concrete Equipment

BLAW-KNOX COMPANY
BLAW-KNOX EQUIPMENT DIVISION
PITTSBURGH 38, PENNSYLVANIA
Offices in Principal Cities

BLAW-KNOX

GET THE ANSWERS!

There's a BEST TIME for any aspect of protective maintenance . . . and HOBBS ENGINE HOUR METERS tell you when that time is reached. Powered equipment lasts longer and requires fewer repairs when protective maintenance services are done ON TIME.

Not a Revolution Counter

It's an electric timing instrument that shows HOURS and MINUTES of engine operation . . . for both mobile and stationary equipment. No revolution counter can provide HOBBS HOUR METER accuracy . . . accuracy so essential to genuinely effective protective maintenance.

Approved by Leading Manufacturers

Installed as original equipment or recommended as an approved accessory by leading construction equipment manufacturers. Built for rough going . . easy to install. See your factory branch, representative or distributor or WRITE:

HOBBS *Engine Hour* METERS

New and improved through continuing engineering research

ORIGINATED AND MANUFACTURED EXCLUSIVELY BY
John W. Hobbs Corporation
2067 YALE BLVD. SPRINGFIELD, ILLINOIS

New to the line is this Drott grubber blade, mounted on a TD-18A which pulls a Model 31 deep tillage offset disk harrow. This land-clearing combination knocks over 18-inch-diameter trees, grubs stumps, and pulverizes trunks and limbs in one operation.

Keeping the Roundup in a western vein were officers of the Rish Equipment Co., W. Va. Left to right are H. D. Anderson, vice president and general manager; P. A. Stanton, C. L. Johnston, and W. S. Russell, branch managers; Lon Rish, president; and J. B. Supler, service manager.

been designed primarily for push-loading, this 200-hp diesel-engine crawler will not be restricted to that type of work.

The official opening of the Roundup saw Harald T. Reishus, vice president and head of the Industrial Power Division, and sales manager I. P. Payne representing the company before the dealers. C. E. Jones, assistant sales manager of the division, was master of ceremonies for the opening. As each of the machines in the company's line passed before the grandstands, two narrators described their various features.

Equipment at Work

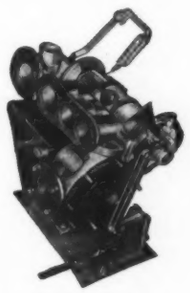
As the Roundup moved into its second day, ten demonstration sites with separate grandstands were set up through the 6½-square-mile area. Each type of equipment shown on the previous day was given a workout before smaller audiences of dealers who got a close view of the machine in operation. Fourteen buses were pressed into service to transport the distributors from site to site. Coordinating the movement of the visitors was an elaborate radio network, installed on the grounds with the aid of Gen. Frank G. Fraser, adjutant general of the Arizona National Guard. This same system also relayed incoming telephone calls to individuals scattered throughout the grounds.

One of the most rugged demonstrations made at the Roundup had International's new rubber-tire two-wheeled tractors working over the most difficult terrain in the proving grounds. With a loading assist from

(Concluded on next page)

ROSCO'S P. M.*
. . . Accurate application with the
Rosco BITUMINOUS DISTRIBUTOR

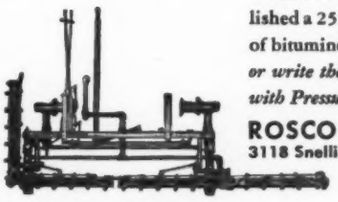
Pressure Metering PATENTED permits the operator to use any length of spraybar—from 1 to 24 feet—*without changing the pressure* and *without any application adjustment whatever.* This "built-in" control of pressure is the only accurate method of obtaining precise bituminous application.



Cutaway View of the Rosco 7-Way Master Valve

Application of bitumen is *not* metered by the bituminous pump, nor is the amount of discharge measured in relation to the revolutions of the pump. Normal wear of the pump and occasional, unavoidable nozzle clogging never affect the application rate. The rate is automatically maintained by Rosco's patented P.M. system, an integral part of the Master Valve. It's this valve that also directs the flow of material for all of the Rosco Distributor functions.

Rosco Distributors with P.M. have established a 25 year record for accurate application of bituminous materials. *Ask your Rosco dealer, or write the factory for bulletins on Distributors with Pressure Metering.*



The Full-Circulating Rosco Spraybar

ROSCO MANUFACTURING CO.
3118 Snelling Avenue • Minneapolis 6, Minn.

★

Full Load...Accurate Dumping...Easy to Operate

The perfect weight distribution of Omaha Dragline Buckets gives a full load with every cast. The entire load is dumped quickly and accurately. Perfect balance makes it easier for operator to spot dump. For over 42 years experienced contractors have relied on Omaha for every Dragline need. Write for complete catalog giving specifications of 4 available types.

Of Course IT'S AN OMAHA DRAGLINE BUCKET

DRAKE-WILLIAMS-MOUNT • OMAHA, NEBR.

(Continued from preceding page)

the new TD-24 torque-converter tractor, the high-speed units were loaded out with 18 heaped yards of caliche and sand in an average of 25 seconds. Haul distance from borrow pit to fill area was 3,500 feet, and the machines made a complete 9,100-foot round-trip haul in an average 5-minute 10-second cycle.

Talks were given by various heads of the division including W. W. Black, head of parts and service; M. F. Peckels, advertising manager; I. P. Payne, sales manager; and John L. McCaffrey, president of International Harvester. Closing remarks were made by P. A. Dufford, general manager of Intermountain Equipment Co., Boise, Idaho, who spoke in behalf of the distributor organization. Following this, equipment representing some 10,000 hp thundered past the grandstand to mark the finale of the Roundup. THE END

Heil Dealer for Ohio

A new distributor for the complete line of Heil Co. truck bodies and hoists is Hoffman Auto Body Service, Inc., Columbus, Ohio. The new dealer, with offices at 1480 N. Grant St., Columbus, will serve counties in central Ohio.

New B-E Distributor

The Louisiana Machinery Co., Inc., Munroe, La., has been appointed sales and service representative for Bucyrus-Erie Co., manufacturer of excavators and cranes, in the northern part of the state. The new distributor will handle the complete line of B-E gasoline, diesel, and electric motor cranes and excavators, as well as the Hydrocrane, Hydrohoe, and Red Arch dragline buckets.

The new dealer has main offices at 9th and Louisville Sts., Munroe. Branch offices are at New Minden Road, Shreveport, and MacArthur and Masonic Drives, Alexandria.

Harold O. Thompson, president of the Thompson Materials Corp., which last month marked the golden anniversary of its founding.

Thompson Co. Marks 50 Years As Dealer

The Thompson Materials Corp., Belleville, N. J., a dealer organization which has supplied construction items for the George Washington bridge, the Lincoln and Holland tunnels, and La Guardia, Idlewild, and Newark airports, last month celebrated 50 years of continuous business operations.

Harold O. Thompson is the president of the organization, which was founded in 1904 by his father, James J. Thompson, Sr. Originally, the company was a hay and feed enterprise located at 204 West Street in downtown New York. Then, as motorized transportation and paved highways came of age, the company began to stock materials for road work and heavy construction.

Expanding operations in 1941, the company moved to Belleville. Most of its operations are now done from the Belleville headquarters, although the company still maintains offices at the original address in New York.

Today, the company supplies more than 60 items to road and building contractors, principally in the New York and New Jersey areas. Sales, service, and delivery, however, have extended all over the country and to Iceland, Labrador, and South America. The firm employs a staff of about 50 people and maintains a fleet of 15 modern trucks and three large storage yards.

New Gar Wood Distributors

Dealers for Gar Wood Industries, Inc., Wayne, Mich., have been appointed in Michigan and New Mexico. Gar Wood excavators, Buckeye ditchers and spreaders, and Hi-Way wideners manufactured by the company's Findlay Division will be sold in the lower Michigan peninsula by Telford Equipment Co., Detroit and Lansing, Mich.

In New Mexico, Albuquerque Truck Equipment Co., Albuquerque, will handle sales of Wayne Division products, including hoists, bodies, winches, and cranes, in 14 counties in the state.

Harnischfeger Dealer in Canada

Federal Equipment Supplies, Ltd., 55 Industrial St., Toronto, is a new distributor for Harnischfeger Export Corp., Milwaukee, Wis. The dealer, now planning a new branch in Port Arthur, Ontario, will handle sales and service of the P&H line of excavators.

A Big Grader for Less Money
ADAMS "440"

A husky 85 hp. Diesel machine—will do the work on which many 100 hp. graders are now used

Fast, smooth ditch cutting

High-speed mixing and spreading of blacktop

Is this your problem ? . . .
100 hp. grader too much money—
50-75 hp. grader not enough machine.

If so, you'll find a satisfying answer in the husky, 85 hp. Adams "440." Here's a real he-man machine with big-grader capacity—yet costs less to buy, less to operate.

You'll find the Adams "440" capable of a wide range of heavy-duty applications: all types of road construction and maintenance—bank sloping—ditch cutting—scarifying—sub-grading—road mixing—bulldozing—snow plowing, etc.

Investigate the powerful, high-performing Adams "440." Let your local Adams dealer give you an on-the-job demonstration of its many time and money-saving advantages.

J. D. ADAMS MANUFACTURING CO. • INDIANAPOLIS, INDIANA

ADAMS

Motor Graders TraveLoaders Pull-Type Graders

Use the Request Cards Between Pages 18 & 19 To Obtain Further Information or Printed Matter on Any Product Advertised or Described Editorially in This Issue

Use the Request Card Between Pages 18 & 1 To Obtain Further Information or Printed Matter on Any Product Advertised or Described Editorially in This Issue

Joseph A. Lynch heads Lynch-Aeroil Service, a new warehouse distributorship established by Aeroil.

New Aeroil Distributor

Lynch-Aeroil Service, South Hackensack, N. J., is a new exclusive warehouse distributor for the line of roofers' and general contractors' equipment manufactured by Aeroil Products Co., Inc., South Hackensack. The company, with office and warehouse at Green and Christopher Streets, will serve northern New Jersey, Staten Island, and Orange and Rockland counties in New York State.

The distributorship is headed by Joseph A. Lynch, who has been associated with the Aeroil firm since 1944. He held a number of positions in the company before being made advertising and sales promotion manager for Aeroil last year.

Pecaut Equipment Represents GM Division in South Dakota

Serving the state of South Dakota with sales and service of General Motors Detroit diesel engines is the Pecaut Equipment Co., Sioux Falls, S. Dak. Factory approved tools and servicing equipment have been installed in the company's headquarters at 900 E. 8th St., and Detroit diesel engine service will be kept separate from other servicing facilities.

In addition to handling the engines manufactured by General Motors, Detroit, Mich., Pecaut represents the Euclid Road Machinery Co., Ingersoll-Rand, Gormann-Rupp, Construction Machinery, and other manufacturers.

The firm is headed by S. F. Pecaut. Darrel Pecaut is sales manager, William Taylor is service manager, and Robert Schuknecht, parts manager.

ROAD BUILDERS — IT'S SENSATIONAL!

DRAGS **PECKERWOOD** DRAGS

STEEL SPRING WIRE ROAD BROOMS
MADE IN ANY C-O-N-T-I-N-U-O-U-S LENGTH UP TO 12 FEET
WIDTH 6 INCHES—IT'S DIFFERENT
ASSEMBLE YOUR OWN—IN ANY SHAPE REQUIRED—IN MINUTES, NOT HOURS

NO FRAME REQUIRED

MADE WITH KILN DRIED 6" WIDE HARDWOOD AND HEAVY SPRING STEEL WIRES TRIPLE OUT EACH HOLE. NOT STAPLE SET.

THIS IS IT — ORDER NOW

ILLUSTRATION OF 10-FOOT LENGTH ONLY **$3.50**

RUNNING FOOT F.O.B. KC., MO.
NOTICE! Our 15" length Unit Drag 3" wide with the two bolts that fits your frame, still $2.50 ea.

SINCE 1928 **VAN BRUSH MFG. CO.**
327 S. WEST BLVD., KANSAS CITY 8, MO.

Madsen Names Distributors

■ Madsen Iron Works, Inc., 14100 E. Rosecrans Ave., La Mirada, Calif., has appointed 13 new distributors to handle sales of Madsen asphalt plants and plant equipment throughout the United States and Canada.

Nebraska Tractor & Equipment Co., Omaha, and Cornhusker Tractor & Equipment Co., North Platte, will serve the state of Nebraska. Western distributors include Foulger Equipment Co., Salt Lake City, Utah, which will cover Utah and part of Wyoming; Studer Tractor & Equipment Co., Casper, Wyo., which will cover all but three counties in that state; Treasure State Equipment Co., Kalispell, Montana, which will cover the western section of that state; and McCoy Co., Denver, Colo., which will handle all of Colorado.

Other dealers and the territories they cover are M. D. Moody & Sons, Inc., Jacksonville, Fla., a section of Florida; Frank McCaffrey Equipment Co., Cleveland, Ohio, the northern section of Ohio; General Supply & Equipment Co., Inc., Baltimore, Md., Maryland, sections of Delaware and Virginia, and the District of Columbia; Furnival Machinery Co., Philadelphia, Pa., sections of Delaware, southern New Jersey, and eastern Pennsylvania; and The George F. Smith Co., Inc., St. Louis, Mo., eastern Missouri and southern Illinois.

The two Canadian dealers are Mumford, Medland, Ltd., Winnipeg and Manitoba; and Vancouver Equipment Corp. Ltd., Vancouver 10, B. C. They will handle sales in Ontario, Manitoba, and Saskatchewan, and in British Columbia, respectively.

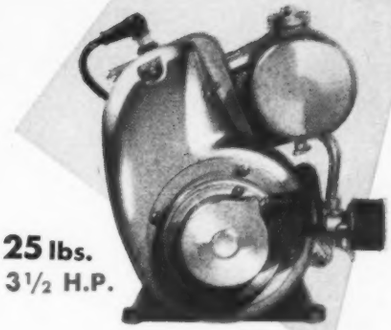
Granco Extends Distribution

Cofar, a product designed to reduce the cost of concrete floor construction, is now being distributed on the east and west coasts. Manufactured by the Granco Steel Products Co., Granite City, Ill., Cofar is a corrugated sheet, with wires welded across the corrugations, which serves both as reinforcement and as a form for concrete. Granco, which develops and markets steel products for the construction industry, is a wholly owned subsidiary of the Granite City Steel Co.

Added to the company's list of 28 agents are three new representatives, the San Francisco branch of the Soule Steel Co., 1750 Army St., San Francisco, Calif.; Norris Steel, 1937 W. 169th St., Gardena, Calif.; and Builders Iron Works, 24 Dane St., Somerville 43, Mass.

can Lightweight help your product?

15 lbs.
2 H.P.

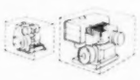


25 lbs.
3½ H.P.

LOOK AT THESE FEATURES

Lightweight
A standard 3½ H.P. industrial engine weighs as much as two and one half Power Products industrial engines of 3½ H.P.

Compact
A unique design makes this engine amazingly compact. A comparison of overall dimensions shows a saving of 72% in size over the standard engine.



LOOK AT THE RESULTS

"Pump and motor weigh only 25 lbs," reports a leading pump manufacturer. This is typical of the kind of amazing lightweight products these engines make possible.

"Only 41 lbs., and usable anywhere, at any angle." Grain auger manufacturers are among the many who have found it possible to revolutionize their products with these engines.

LOOK AT THE PRICE

Despite these advantages, these engines are actually from 6 to 17% lower in price than other available engines of comparable horsepower.

Look to the Power Products Industrial Engine for your products.

These NEW Power Products industrial engines can revolutionize your portable power equipment

No other engine available today can match the weight savings of these new Power Products industrial engines. Not just "a little lighter" these engines actually cut former engine weights in half.

If you make or sell any portable power equipment, you know how important weight is to your customers. You want to save pounds — but with the weight saved by these engines, it is actually possible to revolutionize the entire product — get rid of wheels and carriages — save extra weight and, more important, save dollars.

These new Power Products engines are the result of incorporating, in an industrial engine, the features proved in the famous Power Products engines produced for lawn mowers and chain saws. The resulting engine is lighter in weight — requires less effort to start — is easier to service than any other industrial engine now on the market.

POWER PRODUCTS CORPORATION
2005 No. 12th Street — Grafton, Wisconsin

Gentlemen:
I know what important advantages weight saving can give my products. Please send me full information on these new engines.

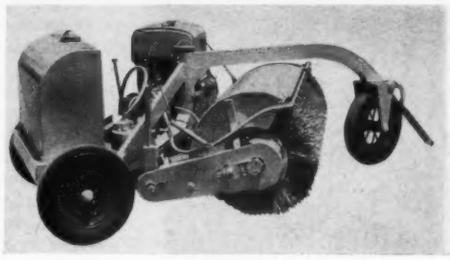
Name .....
Company .....
Address ..... State .....

Data on Wrecking Balls And Cable Weights

■ A leaflet on cast semi-steel wrecking balls and cable weights is available from Frederick Iron & Steel, Inc., Frederick, Md. A feature of the pear-shaped wrecking balls is the E-Z Swing steel eye that will not permit the hook to slip out accidentally. Excessive ball movement is decreased and the cable has greater protection. Weights available from stock range from 500 to 8,000 pounds.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 685.

Engine-Driven Sweeper in Pull-Type Model



The recently announced Grace Model MB104 drawn sweeper is suitable for road work.

■ A new model road sweeper is announced by the W. E. Grace Mfg. Co., 6003 S. Lamar St., Dallas 15, Texas. This is a drawn sweeper suitable for road and airport work.

The MB 104 uses a VE 4 Wisconsin engine, the engine swinging with the brush when the sweeping angle is changed from one side to the other. A standard gear reduction and power takeoff is furnished on the engine, and this, with the chain drive on the brush, comprises the power train.

Antifriction bearings are used throughout. A heavy-duty oil-bath air cleaner and a precleaner reduce engine wear.

For further information write to the company, or use the Request Card that is bound in at page 18. Circle No. 817.

Land-Clearing Rakes

■ Heavy-duty land-clearing rakes for Allis-Chalmers tractors are illustrated in literature from the Rockland Allied Equipment Corp., Harborside Park, Providence 5, R. I. This literature covers three models of rakes and also shows brush racks and push-arm assemblies in a number of sizes.

The rakes include the Model RF, a general-purpose rake with teeth curved to give a rolling action to the debris being rooted out. The teeth have replaceable wear points and are fastened to the main beam with bolts.

The Model RF-1 has cast tooth shanks in three designs for road scarifying, rock removal, or brush piling. Each tooth shank fits into an internal box inside the main beam and is easily changed.

The Model RF-2, also offered in three tooth designs, has teeth of high-yield alloy steel fastened to the main beam with two vertical high-tensile bolts. This model also mounts on tractor loaders.

To obtain this literature write to the company, or use the Request Card that is bound in at page 18. Circle No. 721.

PREFERRED by CONTRACTORS

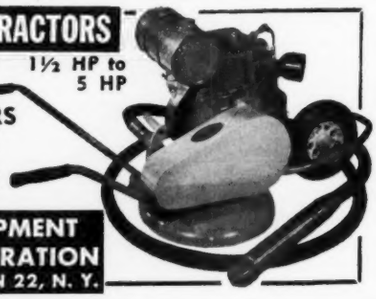
Less initial cost — Lower upkeep

1½ HP to 5 HP

MARVEL CONCRETE VIBRATORS

GV-1, GV-2 & GV-3 MODELS NOW EQUIPPED WITH AUTOMATIC CENTRIFUGAL CLUTCH AS STANDARD EQUIPMENT. INTERCHANGEABLE FLEXIBLE SHAFTS.

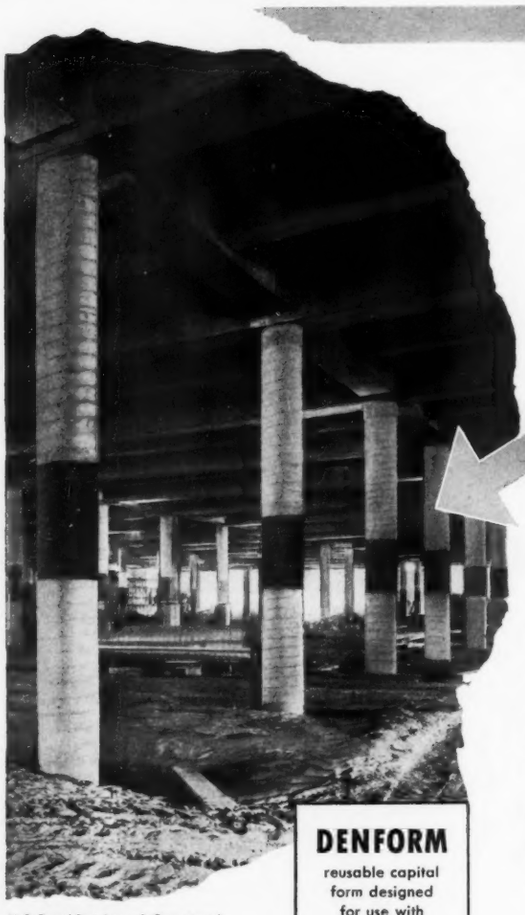
Write for full information



MARVEL EQUIPMENT CORPORATION

215-217 EAGLE ST. • B'KLYN 22, N. Y.

Labor-savers for concrete columns!



U. S. Parcel Post Annex & Garage and New York Central Railroad Mail Terminal, Cleveland, O. Duffy Construction Co., contractors Friedman, Alschuler & Sincere, architects & engrs.

DENFORM reusable capital form designed for use with SONOTUBES. Write for details.

Sonotube®

FIBRE FORMS

for round columns of concrete

Low-cost SONOTUBE Fibre Forms save many man-hours on the job because they are lightweight and easy to handle . . . take less time to erect because they require minimum bracing.

Whatever the structure, for a fast, economical method of forming round columns of concrete use SONOTUBE Fibre Forms.

Approved and accepted by contractors, engineers and architects everywhere because SONOTUBES cost less, look better and save time and labor!

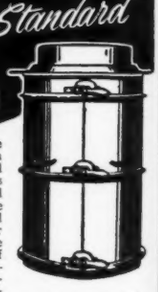
Available in 31 sizes, from 1" to 36" I.D. up to 50' long. Can be ordered in specified lengths or sawed to your requirements on the job.

sonoco — PRODUCTS THE WORLD'S PAPER CARRIERS — REG. U.S. PAT. OFF.

For complete technical data and prices, write

SONOCO PRODUCTS COMPANY
Construction Products Division
LOS ANGELES, CAL. 8955 SOUTH WESTERN AVE. — HARTSVILLE, S. C. — MAIN PLANT — MONTCLAIR, N. J. 14 SOUTH PARK STREET
GARWOOD, N. J. — BRANTFORD, ONT. — AKRON, IND.

THE Quinn Standard FOR CONCRETE PIPE



The Quinn Standard is known as the best the world over, wherever concrete pipe is produced and used. Backed by over 40 years' service in the hands of hundreds of Quinn-educated contractors, municipal departments and pipe manufacturers who know from experience that Quinn pipe forms and Quinn mixing formulas combine to produce the finest concrete pipe at lowest cost.

QUINN HEAVY DUTY PIPE FORMS

For making pipe by hand methods by either the wet or semi-dry processes. Built to give more years of service—sizes for pipe from 10" up to 120" and larger—tongue and groove or bell end pipe at lowest cost.

WRITE TODAY. Complete information, prices, and estimates sent on request.

Also manufacturers of QUINN CONCRETE PIPE MACHINES

QUINN WIRE & IRON WORKS 1645 - 12th St. Boone, Iowa

The Hoist-Master power hoist.

New Boom-Type Hoist Is Self-Powered Unit

■ A new 25-foot wheel-mounted power hoist with a swinging boom has recently been introduced by the Smith Hoist Mfg. Co., Inc., Cassopolis 10, Mich.

The self-powered Hoist-Master Hi-Boom will raise materials from either side of the hoist and will spot them directly on a scaffold or roof, operating through windows, doorways, and over walls. The boom-type hoist comes in four sections and is easily assembled. The equipment moves on four swivel wheels with brake lock.

Two new accessories for hoisting materials, a brick skid-conveyor and a cement and mortar hopper, have also been added to the company's line.

For further information write to the company, or use the Request Card at page 18. Circle No. 819.

Koppers Division Appoints

Four men have been named to new posts in the engineering and construction division of Koppers Co., Inc., Pittsburgh, Pa. H. A. Denny, production manager of the division, is now vice president and assistant general manager. Others appointed are A. B. Fisher, Jr., general superintendent of construction; George P. Wilson, production manager; and Richard W. Vollmer, manager of the chemical and gas department.

Wire Rope Specification

■ A folder describing many types of Bergen wire rope specified for various construction uses is available from the Bergen Wire Rope Co., Gregg St., Lodi, N. J. Using the simple Bergen wire rope data sheet, customers can indicate the class of service, intended use, and special requirements for wire rope. The company's engineers then specify the most effective type for the particular operating conditions involved.

Included in the folder are cross-sectional diagrams of different wire ropes, with technical information on minimum breaking strengths and special characteristics regarding flexibility, resistance to abrasion, and performance under extreme conditions.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 778.

Henry C. Turner Dies

One of the first men to use reinforced concrete in building construction, Henry C. Turner, died June 5 in Newtown Square, Pa.

Mr. Turner, 82, founder and former president of Turner Construction Co., New York, N. Y., was born in Betterton, Md. He received his degree in civil engineering and the degree of doctor of engineering from Swarthmore College. He was a past president of the Metropolitan Builders Association of New York and the American Concrete Institute, and was a member of the American Society of Civil Engineers.

CAMPBELL DETACHABLE CABS

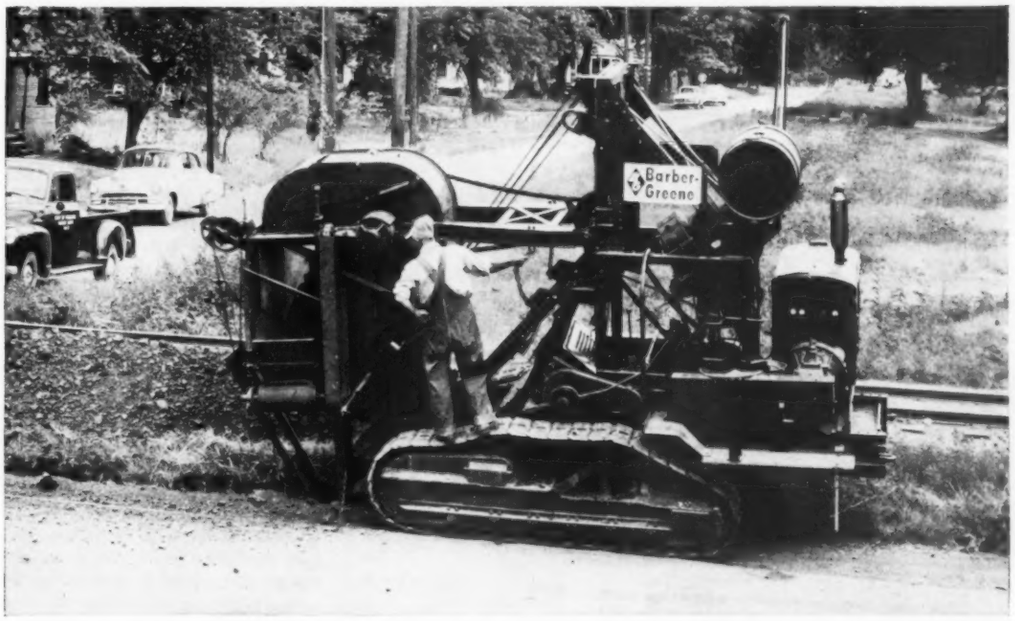
assure • FULL PROTECTION • FULL VISIBILITY • FULL PRODUCTION on your tractor

With a CAMPBELL DETACHABLE CAB on your tractor, your operator can work in any kind of weather—no work stoppage. All cabs have special, light-weight safety glass used throughout.

You will find a detachable cab available for many types of tractor models. Cabs are handled by your industrial tractor dealer.

For complete information on cabs to fill your needs write:

Campbell Detachable Cab Co.
WAUCONDA ILLINOIS



Important Power Developments For Ditchers

Minneapolis-Moline powered Barber-Greene ditchers and Warner-Swasey Gradalls are examples of the trend to heavy-duty power in excavators. Continuous-operation and high-capacity requirements of these models are met by MM engines with a reserve of high-torque power.

Large displacement and high-turbulence combustion of MM engines deliver high torque at moderate rpm to give owners extra years of service with lower fuel and maintenance costs.

Since 1932 MM engines have had pocketed combustion chamber design similar to designs recently developed as new and outstanding by the automotive industry. Special MM chambers provide high-turbulence efficiency with minimum heat-power loss and prolonged power stroke.

MM valves are also typical of extra quality and lasting performance. They have extra high lift—large diameter stem—and exhaust valve seats are special stellite inserts.

Further economy of cost and operation is made possible by the wide range of MM power sizes and fuel types that include the new MM energy-cell diesel units.

INDUSTRIAL MM MODERN MACHINERY DIVISION
MINNEAPOLIS-MOLINE
INDUSTRIAL DIVISION
MINNEAPOLIS 1, MINNESOTA

Sizes from 27—292 hp.

165-4A	4 cyl.	3⅜"x4"	D425-6A diesel	6 cyl.	4¼"x5"
206A-4A	4 cyl.	3⅜"x5"	605-6A	6 cyl.	4⅜"x6"
283-4A	4 cyl.	4¼"x5"	800-6A	6 cyl.	5⅝"x6"
D283-4A diesel	4 cyl.	4¼"x5"	1210-12A	12 cyl.	4⅜"x6"
403-4A	4 cyl.	4⅜"x6"	1600-12A	12 cyl.	5⅝"x6"
425-6A	6 cyl.	4¼"x5"			

EXCAVATING EQUIPMENT

This is the second in a series of articles made up of excerpts from the book, "How To Operate Excavation Equipment", by Herbert L. Nichols, Jr., published this year by North Castle Books, Dept. N, 212 Bedford Road, Greenwich, Conn. Primary emphasis in this series is on the uses, adaptability, care, and safe operation of machinery.

Revolving Shovels Part 2

WALKING DRAGLINES have easy steering and light ground pressure as special advantages. They enable this machine to work in places dangerous or impossible for crawler machines because of difficult terrain, soft footing, or nearness to loose down slopes.

The disadvantages are that these machines are slow, with top speed around ⅛ mile an hour, and are very wide—30 feet or more. They must be disassembled for shipping from one job to another and are at a disadvantage in the bottom of a pit, both because of their width and because they must walk away from their boom, which may be blocked by a hill.

The crawler dragline attachment does not have the positive digging force of the dipper and the pull shovel as the bucket is neither weighted nor held in alignment by rigid structures, and can therefore bounce, tip over forward, or drift sideward when it encounters hard material. The outstanding advantages of a dragline over all other rigs is its long reach for both digging and dumping, plus its ability to dig below the tracks. It has the further good point of a high-cycle speed.

The dragline is the only practical attachment for extensive digging in mud, as its reach enables it to handle a wide area from a single stand, and the sliding motion of the bucket avoids trouble with suction. It is also the best machine for many types of stripping operations.

In easy digging, dragline production should be between 60 and 90 per cent of that of a dipper shovel of the same size, if trucks are loaded on the same level. If trucks are in the pit, output may range from 70 to 100 per cent.

In hard digging, dragline yardage falls off much more rapidly than shovel yardage because of weaker penetration. In side-casting, production on a volume-distance basis may be much higher than that of a dipper.

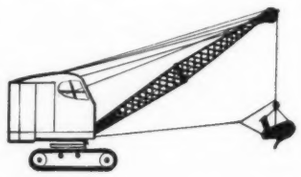
Clamshells

The clamshell front is a jack-of-all-trades. It can do most of the jobs the other rigs will do, although less efficiently, and in addition has its own specialties of digging deep, narrow, straight-sided excavations and rehandling materials neatly.

The machine consists of a boom similar to that used for the dragline, with two boom line sheaves and two operating sheaves at the point, and a bucket hung from the operating sheaves by two cables.

Clamshell work is often done at such depths that the operator cannot see the digging point. In this case it is best to have a man placed so that he can see the work and signal the operator. This is essential if there are men working in the pit where they might be hit by the bucket.

A clamshell has the unique advantages of being able to stand on either the new grade or the old and to excavate at its own level, to a depth limited only by the length of cable its drums will carry, and at a height limited only by its boom



length. It is the best of the rigs for handling bulky objects such as boulders, stumps, and logs, as chaining is usually unnecessary. It is the best tool for piling and burning loose brush and trees. It does not push or pull loose material to other positions as it digs. There are very few excavating jobs which cannot be done with a clamshell, and it is an excellent utility and odd-job rig.

But it is slow. It ordinarily moves fewer yards per hour than any other rig which can do the particular job. This arises from the time consumed in closing the bucket and from the fact that the operator has minimum control over the position of the

THIS New inexpensive towed-type spreader features an exclusive "staggered wheel" arrangement consisting of 10 pneumatic tired wheels keeping the unit level at all times - maintaining a level finish course.

Spreads evenly from edge to edge - cut-off runners on each side form untapered sharp edges.

Screed is fully adjustable in height by dual controls at each end permitting spreading depths from ½" to 8".

Handles rock 4" in size for base course. Hydraulically operated shutoff gate allows operator to start or stop material flow from hopper. Simple truck hitches easily installed and spreader is automatically coupled to them. Uncoupling is just as simple.

For travel between jobs, this Hi-Way Bituminous Spreader can be chained to dump body and hoisted off the ground by 1 man in a matter of minutes.

4 sizes available - 8', 9', 10', and 12' spreading widths, with cut-off attachment for adjusting width of spread. Motor driven auger-type agitators available with 10' and 12' widths to insure even feed over full width.

Write for full information.

MODEL R - Tops in towed spreaders for sealcoating and road stabilization. One man operation. Spreads forward or reverse - fine sand to coarse stone - evenly, accurately. Bank of spring steel fingers let over-sized stones pass through. Staggered arrangement of 10 rubber tired wheels provide real stability, smooth finish.

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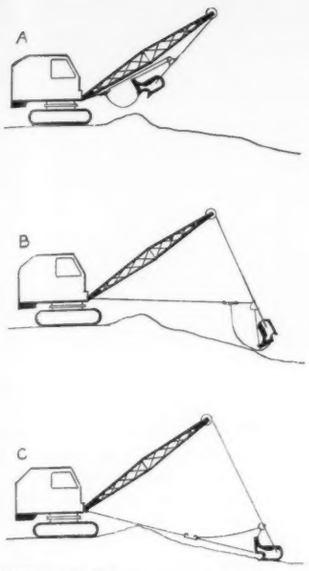
St. Paul, Minnesota



Casting a bucket.

bucket, which is always directly under the boom point unless swung elsewhere. The bucket can be moved toward or away from the shovel by raising or lowering the boom; around the shovel by swinging the boom—outwardly by centrifugal force and inwardly as a pendulum, so that there is no point in its digging range that the bucket cannot reach. But careful operation is required to get it where it belongs.

A number of different buckets are required for best handling of a variety of digging operations, and there is often loss of efficiency in the use of an unsuitable or compromise type.

A clamshell has the same reach as a dragline, except that the bucket cannot be cast as effectively. Since most digging is done directly under the boom point, maximum depth in "diggable" soil is determined by the amount of cable the drums will carry. Dumping height is controlled by the height of the bucket, which is variable; no diagram of working ranges is needed.

Cranes

The crane attachment may consist simply of a digging or hoist line run over a sheave on a lattice boom point, and down to a hook or clamp. More precise control may be obtained by attaching the hook to a sheave block, and reeving a line of two or more parts between it and the boom.

A jib boom can be added to the regular boom to obtain greater reach and keep bulky loads from swinging into the boom. Lifting capacity is usually less than half that of the crane itself. It leaves the point sheaves free so that another line for heavier lifting may be reeved in the conventional manner.

Cranes lift by means of chains, slings, ropes, or tongs which grip the load and are caught in the hook. Other attachments can be used in the same manner by passing a chain around some part of the bucket or stick, or catching it in a specially made hook or bracket, and using the chain hook to pick up the load.

The crane is more efficient than other rigs for most hoisting work as it does not carry the dead weight of a bucket and other digging parts. Slower and smoother lifting can be achieved by increasing the number of lines, and the operator has a better view of the hook and the load.

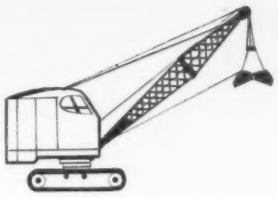
There are a few jobs where a digging attachment is more convenient, as the bucket can be used to move or overturn the load to make it easier to get a chain around it.

Cranes can carry loads from place to place. Those mounted on rubber tires do this better than crawlers. When mobility is more important than height of lift, a shovel dozer may be preferred for this type of work, particularly in spots where maneuverability is difficult.

The lifting ability of a crane does not depend primarily on engine power, but on balance. The balance point or line is the end or edge of the tracks, tires, or outriggers toward the load. The weight of the shovel itself tends to hold it flat on the ground, and that of the load, most of the boom, and the force exerted while raising the load all tend to tip it. Weight on either side becomes more effective as its distance from the balance point increases. The entire machine functions as a first-class lever with the fulcrum at the balance line.

The balance of a crane can be improved by adding counterweight (but not enough to encourage straining its structure), by raising the boom so that the load is brought in closer, or by using extra-long tracks or outriggers.

Putting the crane on a slope will shift its center of gravity downhill, increase the effective boom height uphill, and decrease it downhill. More weight is placed on the downhill edge so that sinking into soft



ground at that end may make the machine slope greater than that of the ground. Slanted ground will therefore increase stability against uphill loads and seriously diminish it downhill.

Crawler cranes are rated to lift 75 per cent of their tipping load in the least stable direction at their maximum boom angle (usually 75 to 80 degrees above horizontal) when standing on hard level ground. Tipping is said to occur when shovel

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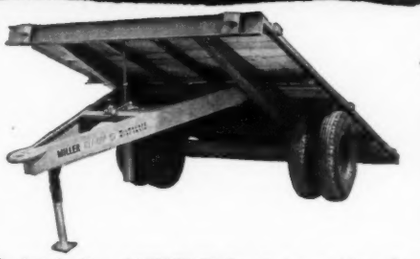

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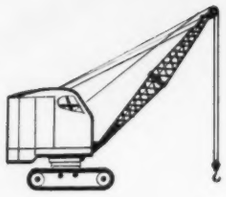


weight no longer rests on the outer track rollers, even if the track itself is still on the ground. Draglines and clamshells are usually rated at 67 per cent of tipping load because their burden may be increased by suction or by digging beyond the boom point, and they often work on less stable footing than do cranes.

Rubber-tired cranes may be rated at 85 per cent of tipping load as they have more reserve stability at the tipping point.

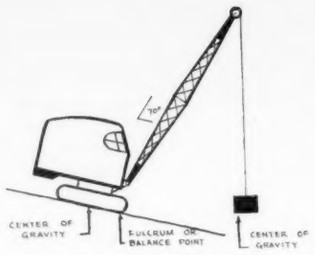
A crane can lift maximum loads only if the boom is high enough to place them close in. It can handle lesser loads with greatest safety and convenience if they are close enough so that there is no question about stability. The strain on the very vital boom hoist line and compressive forces on the boom itself are greatest with a low angle and least with a high one.

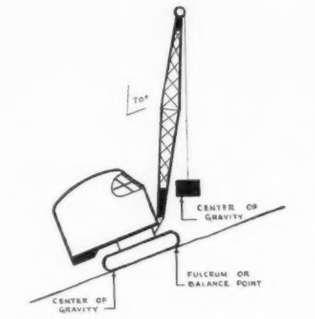
A boom may fall back on a shovel if it is raised past its center of gravity; or as a result of swinging it from a downhill to an uphill direction, walking the machine onto an upgrade, pitching as it walks or swings on uneven ground, or recoil from a dropped or released load.

A crane operator usually has a much more responsible job than an excavator operator. He customarily works with a ground man or crew who will be endangered by his mistakes, and he is liable to be near buildings or other valuable property. The loads he handles may be both expensive and fragile.

Most accidents are caused by falling or swinging loads. Slings or other fastenings can break or slip off. The crane operator should be fussy about both their strength and their manner of fastening. He should inspect his cables frequently and change them as soon as they are under suspicion. He should be particularly careful about the boom cable, as a falling boom is many times more destructive than a load alone.

Questionable loads should be tested before being lifted and swung. This can be done by lifting barely off the ground with the boom in the least stable position—over the side or downhill—with the boom lowered to give a radius about 25 per cent greater than that which will be used in handling. Another procedure is to lift the load, then boom out (down) until the machine starts to tip. A safe lifting radius is about 80 per cent of tipping radius for crawler cranes and 90 per cent for rubber-tired cranes.





Crane balance on slope.

Skimmers

The skimmer attachment is less popular than the other rigs described. It uses a boom and jack boom similar to those of the pull shovel, and these may be interchangeable, with field alteration of the boom accessories.

This rig is best used for comparatively shallow excavation and finds its greatest use in removing old street paving, horizontal coal layers which have been uncovered by stripping overburden, or any other material to be dug in layers too thin for efficient dipper stick work. Because of the horizontal bucket motion, it leaves a smooth subgrade with minimum effort or skill on the part of the operator.

It digs powerfully once it can get under the layer being removed, but has difficulty cutting down, so that a starting cut must sometimes be made by other machines. Because of the fixed angle between its teeth and the work, it does not handle boulders successfully, and on the whole is not flexible enough for general excavation. A skillful operator on a dipper stick can duplicate skimmer performance so closely that the skimmer is a good investment only if a large amount of work within its narrow range of ability is available.

The skimmer attachment is not available for the majority of popular shovels, but is made to order in capacities from ⅜ yard up.

(TO BE CONTINUED NEXT MONTH)

American Chain Warehouse

The American Chain & Cable Co., Inc., Bridgeport, Conn., has opened a warehouse and office at 2210 N. W. Roosevelt St., Portland, Oreg., which will stock wire rope and slings for contractors in Oregon, Washington, and part of Idaho.

4
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Replacement cost—$300.00
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SPECIAL PRICE
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Other Features Same As Above
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ITEM #126 — Four-way open center control valve, with built-in adjustable relief valve factory set at 1000 P.S.I. Spring loaded neutral position. For use with one double acting cylinder. In neutral position cylinder is locked and pump unloaded. Can be used as single unit or mounted in series. Has ¾" pipe thread inlet and outlet. ½" pipe thread cylinder ports. Finger grip handle
Ship. wt.—10½ lbs.
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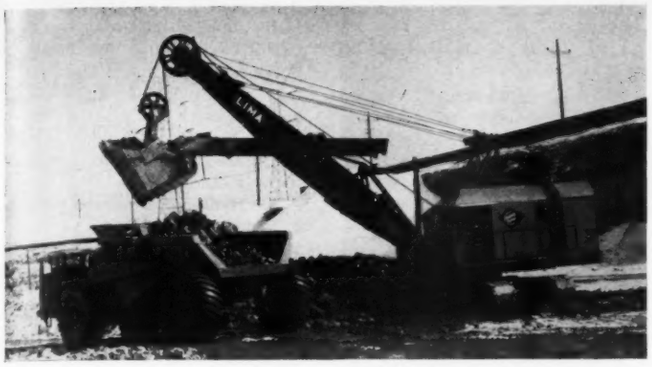


The new Athey Model PR 21 rear-dump trailer, pulled by a Cat DW21 tractor, is loaded by a Lima shovel.

End-Dump Trailer For Two-Wheel Tractor

■ A new rear-dump trailer for the Caterpillar DW21 tractor has been announced by Athey Products Corp., 5631 W. 65th St., Chicago 38, Ill. The Athey Model PR21 rear-dump trailer carries 31 tons or 22½ heaped yards based on 1 to 2 slope.

The trailer features a wide and open-mouthed body and has a low over-all loading height which averages 9 feet 5 inches, and is 6 feet ½ inch at the rear. A wide shield extends across the body to protect the tractor and operator. The body is constructed of ⅝-inch steel and has a sandwich bottom with ¾-inch armor-plate as top layer, a heavy oak-planking filler, and a ⅜-inch bottom plate. Axle members are of structural steel, and axles bolt into place. The tread of the trailer is 115 inches.

Two Athey three-stage hydraulic hoists lift the body to a 60-degree angle to spill the entire load. The lip of the body extends well to the rear of the tires to throw the load away from the wheels. With the pivot on the body, the rear wheels will draw closer to the braked front wheels or, if the rear wheels are braked, the front wheels will draw closer to the rear wheels as the load is dumped.

The Model DW21 tractor's constant mesh transmission has five gears, ranging from 2.16 mph to 20 mph. It is powered by a 6-cylinder Cat diesel engine that produces 225 hp at 1,900 rpm. The unit steers hydraulically and pivots 90 degrees in either direction. Turning radius is 16 feet 9 inches with the body down, or 13 feet 5 inches with the body up. The two units turn together in a 34-foot width without stopping.

For further information write to the company, or use the Request Card at page 18. Circle No. 682.

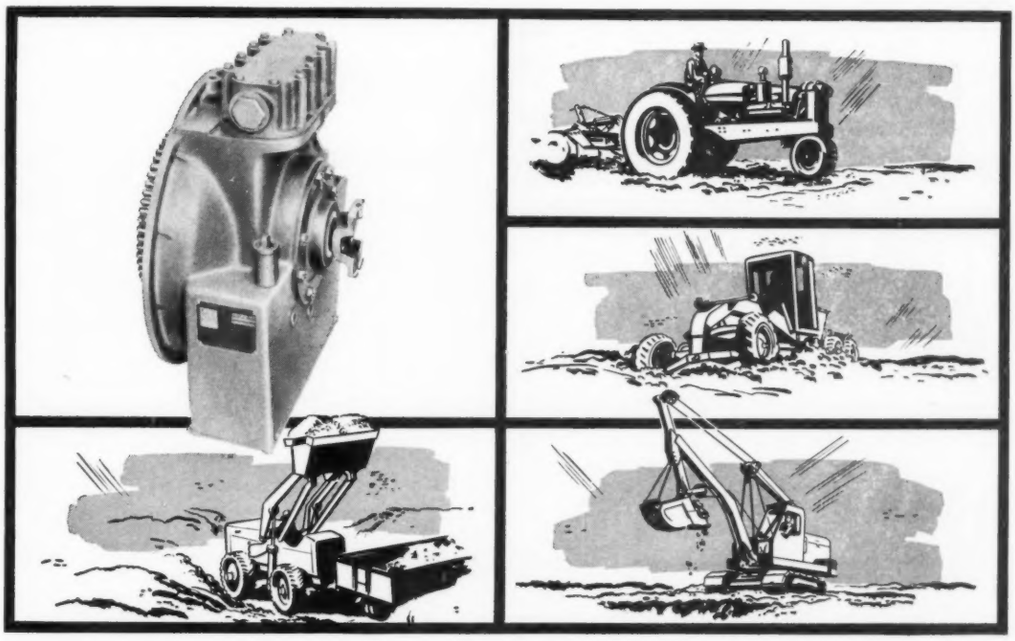
A workman opens a Fold-A-Way section top on a new Patent extra-wide ladder scaffold.

Wide Ladder Scaffold Has High Clearance

■ A high-clearance folding scaffold can be built using the new extra-wide aluminum ladder scaffold developed by The Patent Scaffolding Co., Inc., 38-21 12th St., Long Island City, N. Y. Ladder frames are 4 feet 6 inches wide and 6 feet, 5 feet 4 inches, or 4 feet high.

Since braces can be moved to the top three rungs, clearances up to 5 feet 10 inches high are possible when using the new units as the base for a 4-foot 6-inch x 6-foot Fold-A-Way scaffold. Maximum clearances of 5 feet 10 inches high x 9 feet wide are possible with the extra-wide scaffold.

For further information write to the company, or use the Request Card at page 18. Circle No. 728.



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★ EASY TO INSTALL
★ COMPACT
★ LOW-COST

YOUR 40- to 150-horsepower industrial and automotive engines and equipment will last longer, perform better, with a low-cost heavy-duty Allison TORQMATIC Converter protecting engines and drive lines from harmful shock loads.

And manufacturers now are offering this shock-free power transmission in their models with little or no change in equipment design.

The new Series 200-300 TORQMATIC Converters *are priced to compete* with converters designed primarily for passenger cars—*sell for less than* most comparable industrial units.

And the new *completely self-contained* TORQMATIC Converters take up little more space than conventional clutch power take-offs—have standard SAE #3 engine mountings to fit any gasoline or Diesel engine in their range.

Many options, including front disconnect clutch and adapter, rear disconnect clutch adapter, standard flange, industrial shaft with or without governor drive, permit installation in a wide range of hard-working units. For full details on how easy TORQMATIC Converters are to install in your equipment, ask your equipment dealer, manufacturer or fill in the coupon and mail to:

Allison Division of General Motors
Box 894C, Indianapolis 6, Indiana

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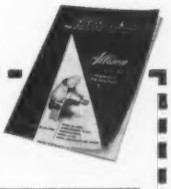

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Box 894C, Indianapolis 6, Indiana

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famous for performance since 1888

Wrist-Action Dipper Adds to Backhoe Power

■ An improved version of the Bucyrus-Erie H-3 Hydrohoe hydraulic drag shovel features a dipper with "wrist action" to increase the unit's digging force. The dipper rotates in a vertical plane through an arc of 65 degrees—from a position 25 degrees ahead to 40 degrees behind the handle. This action not only provides greater digging force, but also lessens spillage and increases ranges for clean dumping into trucks.

The new dipper can dig vertical or undercut walls and trenches which have a greater depth than length. In addition, the pitch or rake of the dipper teeth can be changed during the digging arc for the best cutting angle, enabling the machine to pry out rocks or to expose pipe with less danger of pipe damage. The machine's ability to make continuous passes without stalling results in greater production.

According to the manufacturer, rotating the dipper while the digging ram is extended produces about 38 hp at the dipper teeth—a 50 per cent increase in digging power over the standard model. The hydraulic ram controlling the "wrist action" is powered by the pump which normally supplies the swing bank.

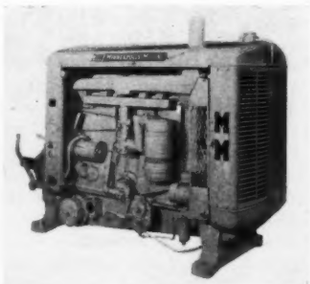
The "wrist action" of the dipper provides for automatic ejection and does away with the hydraulically operated earth ejector. A stationary blade or optional door, around which the dipper rotates, ejects the sticky material.

The Hydrohoe is offered either as a complete machine or as an attachment for H-3 Hydrocranes. Earlier models can be converted to the "wrist action" dipper.

For further information write to the Bucyrus-Erie Co., Box 56, South Milwaukee, Wis., or use the Request Card at page 18. Circle No. 725.

Continuous-Duty Engine With Heat Exchanger

■ Built for continuous heavy-duty operation, the new Minneapolis-Moline Model 800-6A engine features a heat exchanger base pan as regular equipment. This pan is water-jacketed and acts as a heater or cooler to maintain a uniform and proper oil temperature. Thermostats maintain a uniform temperature from the cylinder head to base pan, regardless of load or atmospheric temperature.



The Minneapolis-Moline Model 800-6A engine is designed for continuous heavy-duty service.

The large 800-cubic-inch displacement engine has six cylinders, with 5 5/16-inch bore and 6-inch stroke. It operates on gasoline, natural gas, or liquid petroleum gas.

For further information write to the Minneapolis-Moline Co., Box 1050, Minneapolis 1, Minn., or use the Request Card at page 18. Circle No. 783.

Forum Is Held at Opening Of Fairbanks, Morse Plant

Experts in hydraulics from industry and the field of education held an industry-wide forum on problems arising from the increased demand for water as part of the four-day program dedicating the new Fairbanks, Morse & Co. plant in Kansas City, Kans., late last month. More than 1,000 persons attended.

Gurley current meters now available in fresh or salt water models

Gurley, maker of fine current meters for federal, state and municipal bureaus for 70 years, now supplies its Price Pattern Current Meter in either fresh or salt water models. Gurley's Price Pattern instruments, designed by W. G. Price of the U. S. Geological Survey, are in use around the world.

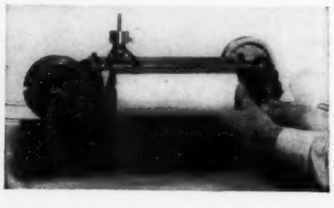
The Gurley Current Meters are available in a variety of outfits for use by overhead-cable suspension...wading-rod suspension...exploration and survey parties. Gurley also makes the Pygmy for shallow streams, flumes and canals.

The salt water model incorporates a commutator which indicates each tenth revolution of the bucket wheel. Sealed commutator box excludes salt water, a conductor of electricity, from the contact chamber. *Write for Bulletin 700.* This illustrated 16-page booklet gives full details on all Gurley Current Meter outfits.

Gurley Water Level Recorders make continuous graphic record for entire day or week.

The float-operated Gurley Graphic Water Level Recorder, simple in construction and operation, is widely used in reservoirs, sewers, sewage disposal and hydro-electric plants, and supplements irrigation and stream gaging measurements.

Made of non-corrosive materials, Gurley Recorders make a *continuous* graphic record. A rectangular chart is used. Available in natural scale models or others adaptable from 1 to 40 feet. *Write for details.*



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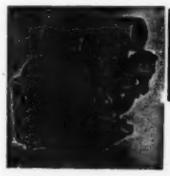

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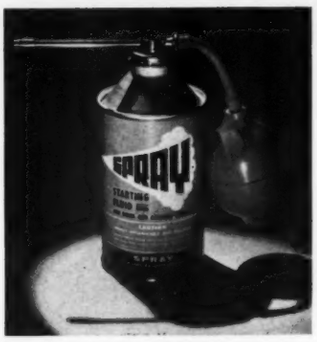
OHLER MACHINERY CO.
WATERLOO IOWA

Engine Starting Fluid

■ A new quick-priming starting fluid for diesel and gasoline engines is made by the Spray Starting Fluid Co., Box 584, Camden 1, N. J. The Spray starting fluid comes in a special applicator that makes its use in the field practical. It is recommended for engines on a variety of earthmoving equipment including tractors and trucks.

The manufacturer points out that use of the starting fluid eliminates much towing and the need for heaters, extra batteries, and special crews.

The fluid consists of a highly volatile base that is readily ignited by engine cylinder compression. Several added ingredients provide top-cylinder lubrication, minimize corrosion and dilution of lubricating oil by fuel, and prevent the depletion of batteries or compressed air.



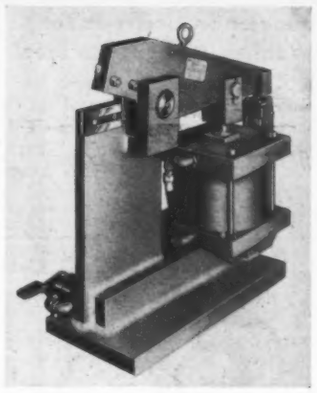
The Spray engine-starting fluid comes in a special applicator that simplifies its use in the field.

For further information write to the company, or use the Request Card at page 18. Circle No. 820.

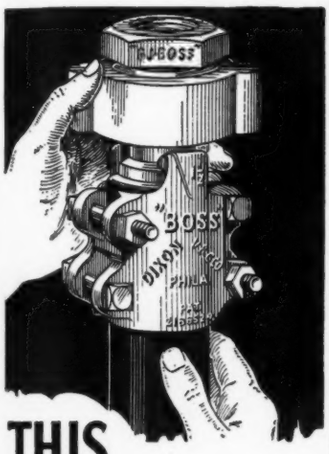
Air-Operated Shear Cuts Reinforcing Bars

■ A new air-operated shear for cutting reinforcing bars and cable has been developed by the Curry Air Shear Corp., 941 Oliver Bldg., Pittsburgh 22, Pa. The Curry Air Shear Model A weighs less than half as much and occupies only one-quarter as much floor space as motor-operated shears, according to the manufacturer. This unit operates from any standard compressor or shop air supply at pressures from 60 to 125 psi. It will cut 1-inch-diameter cold mild steel at 80 psi air pressure. Normal speed is 2 seconds per cycle, but faster speeds are possible if desired.

The shear has 6-inch knives, with four cutting edges, which can be adjusted by set-screws after grinding. Operated by a treadle, it remains closed when not cutting.


The Curry Model A Air Shear.

For further information write to the company, or use the Request Card at page 18. Circle No. 775.



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has no equal for efficiency, durability and safety in every high or low pressure hose service . . . steam, water, gas, air, oil, hydraulic. Ground joint union between stem and spud provides leakproof, trouble-free seal. Furnished with super-strong, "Boss" Offset and Interlocking Clamp.

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STYLE X-34

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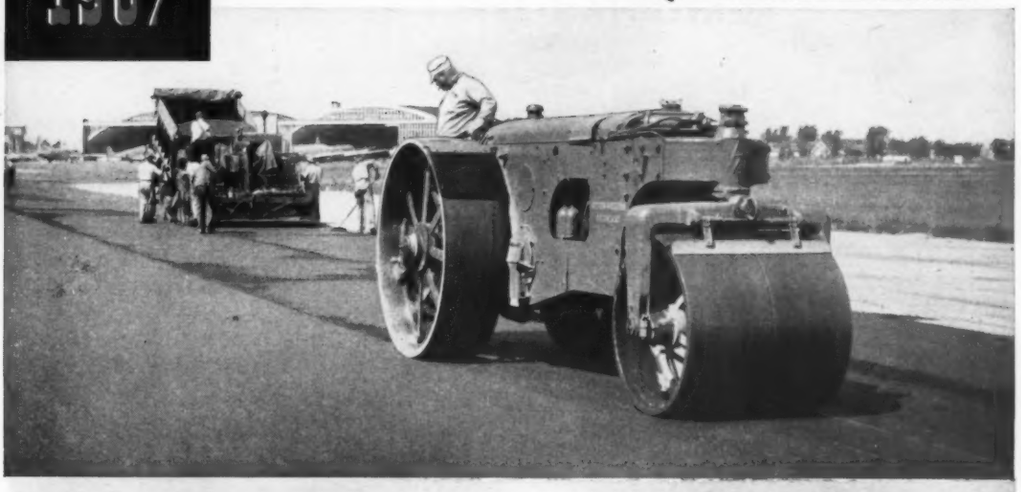

They said it of the "one-lunger" of 1907, and they say it today . . . "Austin-Western rollers stay on the job day after day, and month after month, with less time lost for mechanical adjustments, maintenance and repair." That's DEPENDABILITY! Add to it the precision job of rolling that results from such things as Proper Weight Distribution, Vibrationless Power Units and Smooth Acting Clutches, and you have everything needed for top grade performance. The Autocrat is made in 10- and 12-ton sizes. Each has full-length side plates for maximum rigidity; low center of gravity for smooth operation, and hydraulic power steer. Each may be had with gas or diesel engine. Special equipment includes lights, sprinkling system, canopy top and powerful hydraulic scarifier.

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Road Rollers · Hydraulic Cranes
Construction Equipment Division

Manufactured by
AUSTIN-WESTERN COMPANY
Subsidiary of Baldwin-Lima-Hamilton Corporation
AURORA, ILLINOIS, U.S.A.

Booklet on Electrode For Welding Manganese Steel

■ A new electrode for welding manganese steel is introduced in a bulletin from the Alloy Rods Co., 5129 Lincoln Highway W., York, Pa. Wear-Arc Super WH is a new alloy in this field and is reported to have physical properties superior to manganese plate and conventional manganese electrodes. The bulletin gives complete details on physical properties, applications, and welding procedures.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 699.

"BERG" Concrete Surfacer

A light-weight, portable, electric motor-driven Concrete Surfacer consisting of the Model R2 Right Angle Head and Model AS Motor Unit.

Ideal for surfacing concrete buildings, bridges, dams, walls and many other applications.

Quickly converted into the Model V2-AS Concrete Vibrator for internal vibration by substituting the Model V2 Vibrator Unit for the above Head.

The Concrete Surfacing Machinery Co.

4665-4669 Spring Grove Avenue — Cincinnati 32, Ohio

The new Anthony twin telescopic hoist and dump-body unit.

Dump Body and Hoist

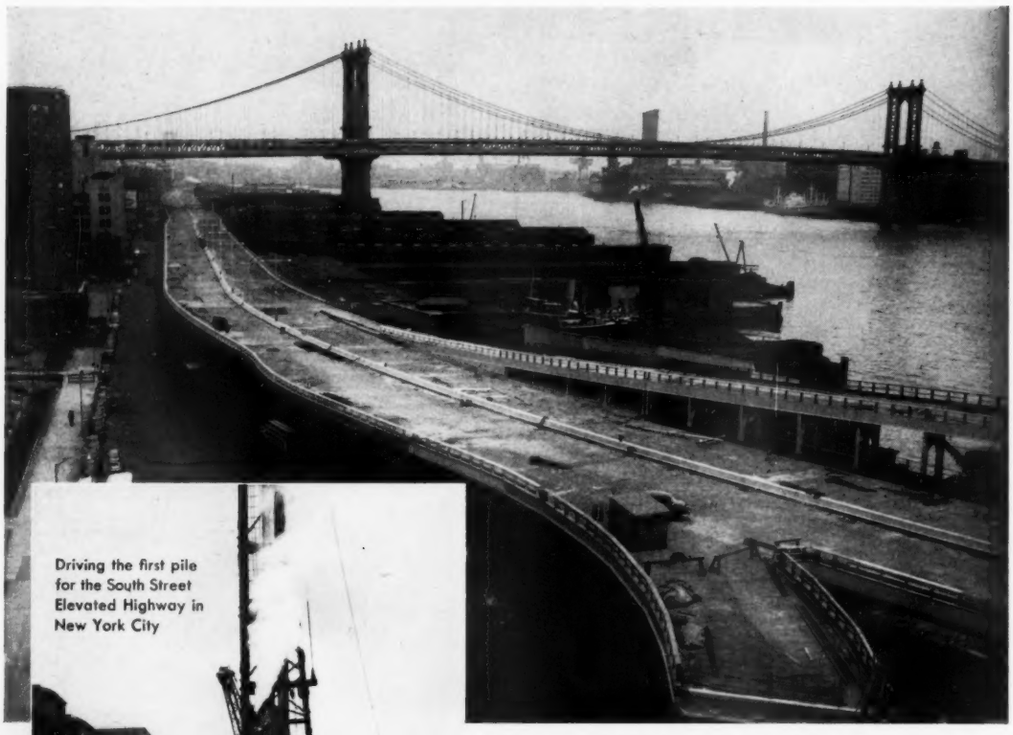
■ A new twin telescopic hoist and dump body was announced recently by the Anthony Co., Inc., Streator, Ill. The Anthony hoist features light weight and a greater front-axle load distribution for more legal payload. Moreover, because of the length of stroke of the telescopic hoist, the lifting point can be at the front end of the body for more power.

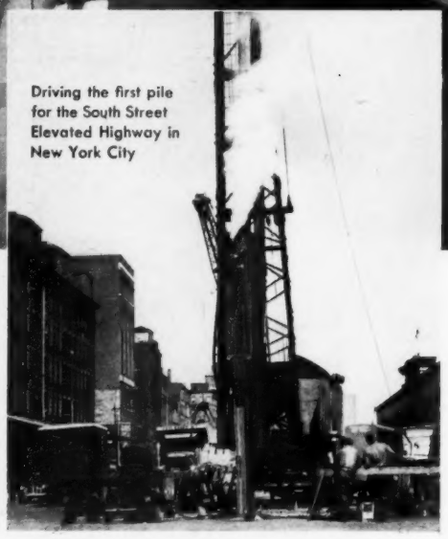
A further feature is that the hoist has a self-contained subframe which takes the load of the body and protects the chassis frame. Other features are the low mount and compact look of the entire hoist and body unit. The telescopic line of hoists is available with capacities from 10 to 26 tons for truck bodies of 11 to 13 feet in length and with volume ratings of 6 to 15 yards.

For further information write to the company, or use the Request Card at page 18. Circle No. 821.

New York's Newest Highway

Rests on Piles Driven by McKIERNAN-TERRY Hammers





Driving the first pile for the South Street Elevated Highway in New York City

The South Street Elevated Highway in New York City is the newest link in the circumferential express road around Manhattan Island. It is built on "made" ground along the lower end of the East River, so its columns had to be supported on piles driven to bed rock.

Approximately 1,600 H-beam piles were used for this 1½-mile link, varying in length from 35 feet to more than 200 feet, and the job was vastly complicated by operating in one of the city's most congested areas. For this critical work, the contractor, Fehlhaber Corp. of New York, selected McKiernan-Terry S10 Single-Acting Pile Hammers.

Contractors all over the country are accustomed to use McKiernan-Terry strong speedy equipment for every type of pile-driving job. Write for bulletin describing the complete line of 18 sizes of double-acting hammers and extractors and single-acting hammers.

McKIERNAN TERRY

McKIERNAN-TERRY CORPORATION, Manufacturing Engineers

Also manufacturers of Coal and Ore Unloaders and Bridges, Grab Buckets, and Special Machinery

19 PARK ROW, NEW YORK 38, N. Y.

MK 355

How to Select a Pump

■ A booklet dealing with the selection of the proper motor pump for any specific job is offered by the Ingersoll-Rand Co., 11 Broadway, New York 4, N. Y. The reference guide gives a brief description of what a centrifugal pump is and how it works. Then it points out the various factors, such as the quantity, pressure, friction losses, and head that must be considered in selecting a pump for a specific purpose.

The next step is the presentation of a typical problem and its solution through the use of charts and curves of various forms. Finally, the booklet recommends pumps for various installations, depending on the type of material to be handled.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 698.

Data on Hose Couplings

■ A revised bulletin describes and illustrates the LE-HI line of Quick-Lock hose couplings. The literature also shows how the hoses can be used with the company's line of air valves for the safe control of compressed air.

The hose couplings, according to the literature, are engaged or disengaged in half a second or less. Once they are engaged, however, a safety spring lock prevents accidental disengagement.

To obtain this literature write to the Hose Accessories Co., LE-HI Division, 2700 N. 17th St., Philadelphia 32, Pa., or use the Request Card at page 18. Circle No. 749.

Truck-Mounted Hoist

■ A truck-mounted hoisting crane is now offered by the Rockford Crescent Mfg. Co., 420 Buckbee St., Rockford, Ill. Standard booms for the new cradle-boom Handi-Hoist are 20 feet high, and others are available in heights up to 28 feet.

The new hoist can be mounted permanently on any truck, 1½-ton or larger, and is operated through a power takeoff. The truck model of the Handi-Hoist complements the trailer-type model.

For further information write to the company, or use the Request Card at page 18. Circle No. 822.

The new truck-mounted model of the cradle-boom Handi-Hoist made by the Rockford Crescent Mfg. Co.

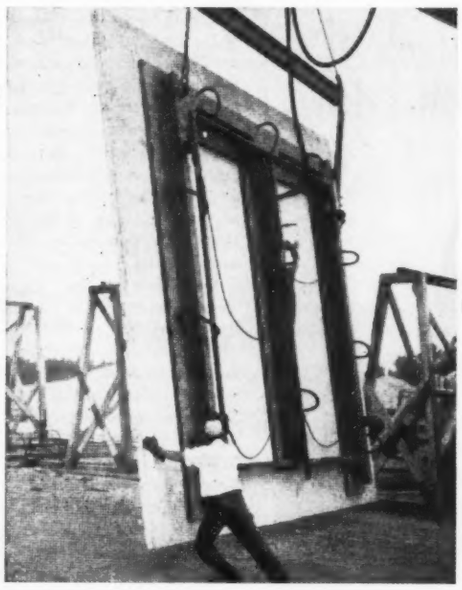
How Calcium Chloride Affects Concrete Mixes

■ A booklet that gives a concise account of how the addition of calcium chloride to a concrete mix results in better concrete construction is offered by the Dow Chemical Co., Midland, Mich. Through the use of charts and graphs, the booklet explains the effect of calcium chloride on concrete.

Increased workability, faster set, greater strength, uniform curing, and construction speed in cold weather are advantages listed. Easy-to-follow instructions on using calcium chloride are also included.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 686.

MAGIC CARPET *for Concrete Handling*



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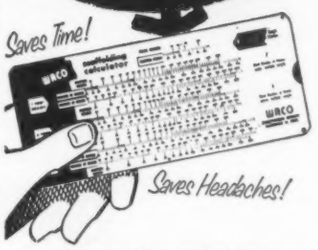
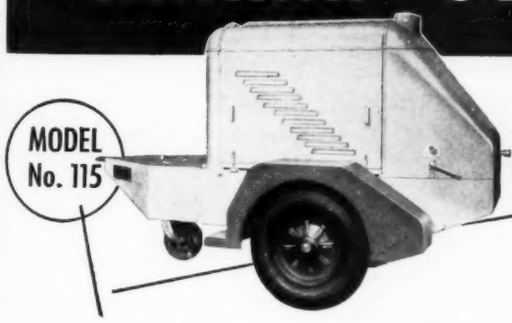


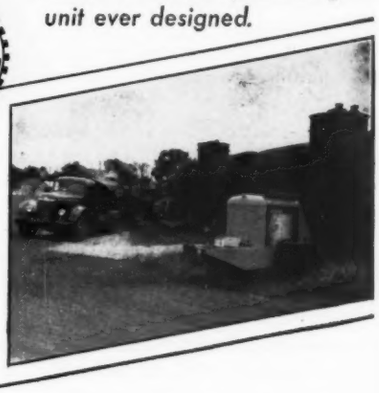
tells you the scaffolding you need for every job.

Tells you in seconds the number of frames and cross braces you need for most jobs. Saves you hours of "desk work." Helps you figure each job closer. Get yours now. FREE! Write today!

"TANKAR" STEAM HEATER



. . . fastest steam producing unit ever designed.



Just hook up this Littleford Model 115 "Tankar" Steam Heater to one or two tank cars of Bituminous materials and in 1/3 less time it can be unloaded. This fully automatic "Tankar" Heater produces 200 lbs. of steam in 2 minutes from a cold start. No waiting—no wasted time. Then too, the "Tankar" Heater produces steam only when steam is needed, saves fuel. The Model 115 Tankar is 85% efficient. Here's a complete "package of steam" engineered to give Highway Departments and Contractors a Low Cost money saving unit.

Model 115 "Tankar" Steam Heater is small, compact, highly portable and easily handled by one man. Can also be used to clean equipment, garage floors, thawing, sterilizing, etc. Automatic controls make it the last word in safety. Take a further look at this amazing Littleford Unit. Write for Bulletin 21.

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AVOID LEGAL PITFALLS

Written Contract Uncontradictable

THE PROBLEM: *On its face, a building contract appeared to be intended by the parties as a complete statement of their agreement, and it referred to detailed specifications. The contractor fully performed the contract as to all specified items, but the owner insisted on additional items. Was the contractor entitled to additional pay for the additional work, even though the owner claimed that the contract was hastily prepared and signed under an oral agreement that the items in question were to be covered by the agreement?*

THE ANSWER: Yes. (Smith v. Marcus, 103 Atl. 2d 277, decided by the Pennsylvania Supreme Court.)

The court applied a well settled rule of law recognized by all courts, to the effect that where the parties to any written contract which on its face appears to be intended to cover their entire agreement, neither party will be later permitted to contradict the terms of the agreement or to claim that additional terms were orally agreed upon. But the rule does not apply if it be proved that, through mutual mistake, or fraud of the party who prepared the written contract, it does not reflect the actual agreement.

Ordinarily, haste in preparing or signing a contract will not in itself justify proof of an oral agreement on omitted terms.

An Accident at T-Intersection

THE PROBLEM: *A new state highway, substantially completed and open to travel but not yet accepted, ended at another highway, forming a T-intersection. There was a "Stop" sign at the transverse highway. Early one morning, a motorist drove over the new highway, stopped at the sign, and then proceeded across the transverse highway and drove into a ditch on the other side. The construction contract required maintenance of warning signs within each section of the new road. Was the contractor liable for the accident?*

THE ANSWER: No. (Vanderwall v. Goodwin, 60 N. W. 2d 916, decided by the Michigan Supreme Court.)

The court decided that the new road ended where it joined the crossroad, and the contractor was not liable for any dangers past that point.

Improvement Assessments Were Not Invalid

THE PROBLEM: *A Kentucky city-council resolution authorized prospective street improvements, if the legislature should pass an empowering law. After the law had been passed, the city proceeded and awarded a construction contract. When the work had been substantially completed and had been accepted subject to correction of defects in construction, steps were taken by the council toward assessing the cost of the improvements against the abutting property, as provided by statute. Could the abutting owners, who had stood by without objecting to the regularity of the proceeding, then maintain a suit to enjoin levy of assessments?*

THE ANSWER: No. (Bradshaw v. Yager, 265 S. W. 2d 486, decided by the Kentucky Court of Appeals.)

The court decided: The improvement proceedings having been initiated on condition that the legislature give the necessary authority; it was not necessary that a new resolution be passed after the legislature granted the authority.

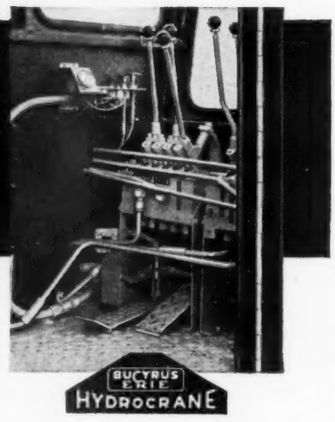
The abutters were not prejudiced by the conditional acceptance of the work, because correction of the defects upon which acceptance was conditioned was completed.

The court cited its previous declarations "that a property owner cannot stand by and permit a contractor to improve the streets abutting upon his property . . . and then after the work has been accepted by the city, attack the proceedings under which the work was done for irregularities which do not render the proceedings void."

Building Code Vs. Contract Clauses

THE PROBLEM: *Specifications of a contract with a city to rehabilitate multiple dwellings permitted the contractor to use plasterboard in bathroom partitions. But a general con-*

BUCYRUS-ERIE presents a NEW UP-RATED SELF-POWERED HYDROCRANE with selector valve



Now Bucyrus-Erie offers a new, more powerful all-hydraulic crane-excavator — the self-powered H-3 Hydrocrane. Taking its power from its own 4-cylinder industrial engine instead of from the truck engine, the new self-powered Hydrocrane provides the following big advantages:

1. **Increased horsepower** through eliminating restrictive influence of side-mounted truck power take-off.
2. **Selector valve operation.** Power concentration selector unit permits channeling hydraulic fluid from all three pumps to one valve bank — increases line speeds up to 50%.
3. **Convenient operation.** Selector valve is foot operated — provides metered control of higher speeds—operator need not let go of hoist and swing levers to operate selector valve. Controls for power plant conveniently grouped at operator's station.
4. **Reduced crane maintenance** from simpler more direct power application. High pressure hoses through center pin leading from pumps to valve bank eliminated. Fewer belts, shafts, and hoses.
5. **Improved efficiency.** Improved oil filtering with less restriction. Better cold weather performance.
6. **Improved truck engine life.** Economy results from fewer truck repair bills. Generator for independent power plant re-charges motor truck battery. Overall fuel consumption is less.

1H54

These are just a few of the advantages of the new self-powered Hydrocrane — and self-power is just one of the big features that is making the Hydrocrane foremost in 1954. See your distributor for complete details.

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470 Fourth Avenue, New York 16, N. Y.

Edited by A. L. H. STREET
Attorney-at-Law

These brief extracts of court decisions may aid you. Local ordinances or state laws may alter conditions in your community. If in doubt consult your own attorney.

dition of the contract required the contractor to comply with state laws. State officials ruled that the partition must be constructed of plaster over lath, and the city ordered the contractor to comply. Was he entitled to extra pay?

THE ANSWER: Yes. (Green v. City of New York, 128 N. Y. Supp. 2d 715, decided by the New York Supreme Court, Appellate Division, First Department.)

The court reasoned: The city called for bids on the basis of the specifications. Bidders could not be expected to "examine the various laws and building codes as to each item specified to see if the codes required some different method of construction. Such procedure would make the bidder's interpretation of the law, rather than the specifications, the controlling factor. It would make the specification so indefinite and uncertain as to destroy the validity of any contract awarded" under such conditions.

No Sales Tax on State Job Material

THE PROBLEM: *Were state road contractors assessable for state sales and use taxes on materials used to build forms into which concrete was poured, burlap used to drape the concrete while setting, and marsh hay used to protect against freezing, none of the materials becoming part of the finished work or having substantial value after use?*

THE ANSWER: No. (Garavaglia v. Michigan Department of Revenue, 61 N. W. 2d 612, decided by the Michigan Supreme Court.)

The court reasoned that the Michigan sales tax law was so worded as to show that the State Department of Revenue had no right to impose taxes that would indirectly fall upon the State Highway Department, because the amount of the taxes would necessarily become a part of the cost of the job.

Engineer-Architects

THE PROBLEM: *California licensing statutes define "civil engineering" as embracing "the following studies or activities in connection with fixed works for irrigation . . . foundations, framed and homogeneous structures, buildings or bridges: (a) The economics of, the use and design of, materials of construction, and the determination of their physical qualities. . . . (e) The preparation and/or submission of designs, plans and specifications and engineering reports". In the light of these and related statutes, may architectural and engineering services—to the extent that they overlap—be rendered either by a licensed architect or a registered engineer?*

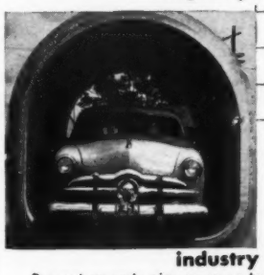
THE ANSWER: Yes. (Lehmann v. Dalis, 259 Pac. 2d 727, decided by the California District Court of Appeal, First District.)

Defendant unsuccessfully resisted plaintiff's suit to collect for services as a registered civil engineer in drawing plans and specifications for a bowling alley building on the ground that plaintiff was not also licensed as an architect.

flatten cost curves with UNIVERSAL Flat-base pipe

conduits

highways



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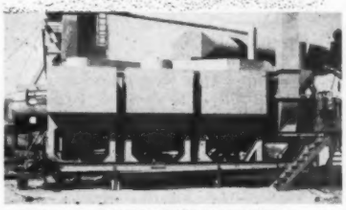

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Yet this CLEVELAND Model 95 "Baby Digger" is moving right along on the job—as shown by the discharge from the conveyor—coming through with the same dependable performance that has made it an outstanding favorite for over 30 years.

This is the kind of job where CLEVELAND'S famous multi-speed transmission really pays off, enabling the operator to select the *right* combination of power and speed for the particular job condition from more than 30 available combinations of digging wheel and crawler speeds.

The "Baby Digger's" compactness and maneuverability also played important parts in completing this job right on schedule in spite of numerous obstructions. The large boulders deposited to the left of the trench in the photo show that good use was also made of CLEVELAND'S reversible conveyor on this job.

Write for descriptive bulletins and specifications, or get the full story on CLEVELANDS from your local distributor.

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"Pioneer of the Modern Trencher"
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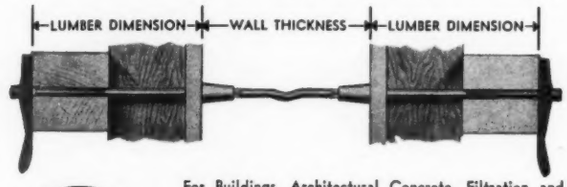

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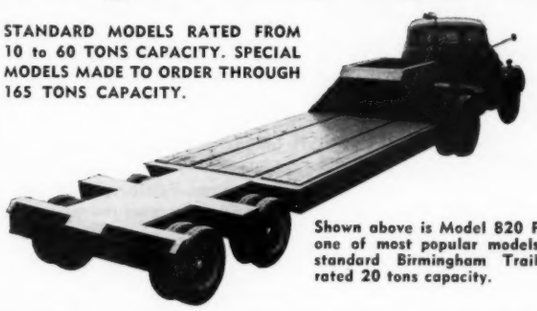
Birmingham Heavy Duty Trailers

STANDARD MODELS RATED FROM 10 to 60 TONS CAPACITY. SPECIAL MODELS MADE TO ORDER THROUGH 165 TONS CAPACITY.



Shown above is Model 820 FLR, one of most popular models of standard Birmingham Trailers, rated 20 tons capacity.

Model 820 FLR shown above fills the need of 99 percent of all haulers. It has tandem axles, is light weight (9,000 lbs.) and gives you maximum payload. It has proved to be a most popular model.

The Birmingham Rocker Beams are fabricated in box sections and are mounted on 4 Brass Bushings, 4" diameter by 6" length. These are greatly oversized for the loads. The bushing assemblies are completely enclosed at one end. The position of the alemite fitting in the closed end feeds the grease out and prevents road dust and grit from damaging the bushing. Frames are electrically welded open-hearth steel shapes. Decks are oak, surfaced to 2¾" thickness. Axles by Standard Forge and Axle Company have Timken bearings. Bendix Westinghouse airbrakes. Full I.C.C. lighting and directional signals.

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MANUFACTURER MEMOS

D. G. Smith Is Elected Head of Safway Steel

The former vice president in charge of production for Safway Steel Products, Inc., Milwaukee, Wis., David G. Smith, has been elected to the presidency of the company. At the same time, Mr. Smith was made a member of the board of directors. As president, Mr. Smith succeeds B. D. Christian, who has been elected chairman of the board.

Other company officers include Henry F. Vogt, vice president; James C. Jay, executive vice president in charge of sales; Walter H. Mettleman, vice president in charge of finance, secretary, and assistant treasurer; J. Victor Loewi, treasurer; and Edward U. Demmer, assistant secretary.

Mr. Smith joined Safway in 1941 and held a number of executive positions before becoming a vice president for the company, manufacturer of portable frame-type steel scaffolding, telescoping steel shores, hydraulic lift towers, etc.

David G. Smith, president of Safway Steel Products, Inc.

How "mountains" are moved 10,000 miles per month with lowered maintenance costs

STANOLUBE HD-M Motor Oil

■ Heavy schedules and heavy loads are all in a day's work with the Ingalls Stone Company of Bedford, Indiana. Each week they deliver "mountains" of this famous stone to their customers—some located as far away as Texas. Monthly trips average 10,000 miles per truck. Trouble-free lubrication is an important factor.

When the company initiated its present preventive maintenance program a Standard Oil Engineer was called in. He supplied them with lubrication recommendations, comparable operating figures and made oil and filter change recommendations. He also advised a switch to STANOLUBE HD-M on all the company's units. Despite continuous operation of equipment, severe loads and high engine speeds, STANOLUBE HD-M has kept engines clean and protected against wear. There has been no downtime due to faulty lubrication. Thanks to good maintenance practices and the use of STANOLUBE HD-M, operating costs have been lowered—and kept low—and the "mountains" of stone have been delivered on time.

STANOLUBE HD-M is Standard Oil's new and better heavy-duty oil. It combines more effective detergent-dispersant action with greater oxidation stability. Your nearest Standard Oil office and warehouse stocks a complete line of Standard quality fuels and lubricants for fast, local delivery. Here too, is headquarters for your Standard Oil Automotive Engineer. Call him today. Or write: Standard Oil Company (Indiana), 910 S. Michigan Avenue, Chicago 80, Illinois.

STANDARD OIL COMPANY

STANDARD (Indiana)

LeTourneau-Westinghouse Names Advertising Chief

Lloyd A. Rager has assumed his new duties as advertising manager of LeTourneau-Westinghouse Co., Peoria, Ill. He was formerly assistant advertising manager for the company, and for four months prior to his new appointment he was sales promotion manager.

The new executive succeeds Joe H. Serkowich, who has been appointed to the newly created position of director of advertising and publicity for Westinghouse Air Brake Co., Pittsburgh, Pa., of which LeTourneau-Westinghouse is a subsidiary.

Mr. Rager joined LeTourneau-Westinghouse in 1937. He began in the company's factory, and progressed through various promotions to the position of manager of the parts catalog department. He was assistant advertising manager for four years before his appointment as sales promotion manager earlier this year.

Mr. Serkowich, in his new position with the parent firm, will coordinate the advertising, publicity, and sales promotion programs of Westinghouse's divisions and subsidiaries.

Sherman Products Elects

William A. Romain, secretary-treasurer and director of Sherman Products, Inc., Royal Oak, Mich., since its incorporation in 1946, has been elected president of the company. Other new officers elected are W. F. Beckman, vice president, and Vincent J. Crampton, secretary-treasurer. Mrs. Janet M. Sherman was elected to the board to fill the vacancy left by the death of her husband, George B. Sherman, former president of the organization.

Elected president of Sherman Products, Inc., is William A. Romain.

Sherman Products, Inc., manufactures the Sherman power digger and Sherman combination transmission, part of a line of construction machinery.

Racine Is Made Manager Of Teco Regional Office

Appointed manager of the Chicago regional office of Timber Engineering Co., Washington, D. C., is Warren E. Racine, a structural engineer of Milwaukee, Wis. From his headquarters at 176 W. Adams St., Chicago, Mr. Racine will provide engineers and builders in Illinois, Wisconsin, and southern Indiana with technical data on the Teco system of engineered timber construction.

Milton J. Weber, a new director of the Frank G. Hough Co.

Hough Co. Names Director

The vice president in charge of procurement for The Frank G. Hough Co., Libertyville, Ill., Milton J. Weber, has been made a director of the company. Mr. Weber, a vice president since 1952, has been with the company since 1941.

Thomas W. Flood, for the past two years production manager for the manufacturer of tractor-shovels and tractors, has been made vice president in charge of manufacturing.

Ryerson Vice President

James M. Mead has been elected a vice president and director of Joseph T. Ryerson & Son, Inc., Chicago, Ill., succeeding Ainslie Y. Sawyer, who is retiring. In his new post, Mr. Mead will be in charge of procurement for the company's 16 steel service plants.

Joining the company in 1919, Mr. Mead served as a general sales representative, manager of the Ryerson plant in Philadelphia, and manager of the company's New York plant, before being elected assistant vice president with headquarters in the Chicago plant.

Elected to Ryerson's board of directors is Russell L. Peters. He succeeds Everett D. Graff, who has retired.

International Vibration Names Ball as Sales Head

The International Vibration Co., Cleveland, Ohio, manufacturer of vibrating-type compaction equipment, has named J. V. Ball to head Vibro-Tamper sales for the company.

Mr. Ball, formerly associated with the Weaver Trailer & Body Co., will work at broadening the company's present distributor sales program.

J. V. Ball, head of sales for International Vibration Co.

Gardner-Denver Head Dies

Edgar F. Schaefer, 58, president of the Gardner-Denver Co., Quincy, Ill., died May 2 at his home in Quincy.

President of the company since 1947, Mr. Schaefer joined Gardner-Denver in 1919, after being graduated from the University of Illinois. Through rapid promotions, he rose from cost clerk to export manager and assistant sales manager for the firm. In 1926, he became vice president in charge of sales and a member of the board of directors. He was elected executive vice president in 1942, and president five years later.

Athey Names New Officers

Among the new officers appointed by Athey Products Corp., Chicago, Ill., are W. D. Lease, vice president of sales; R. W. Kling, vice president of engineering; C. E. Matthews, vice president of service and parts; and R. S. Hinds, treasurer and assistant secretary. Re-elected to office were W. L. Kubick, vice president of manufacturing, and A. E. Saidl, secretary and assistant treasurer.

Mr. Lease was formerly manager of sales promotion for Athey, manufacturer of heavy equipment for use with Caterpillar tractors. Mr. Matthews was formerly manager of the service and parts department, and Mr. Hinds was assistant secretary. Mr. Kling has served as chief engineer since 1950.

Announcing

THE NEW

150-HP CAT* DW15 TRACTOR

the answer to important earthmoving needs!

Do you need a fast, four-wheel tractor that can work effectively in narrow, confined areas, yet keep pace with larger units?

The DW15 is your answer! It has ten forward speeds up to 24 m.p.h. . . . up to 31.3 m.p.h. with optional gears. With matching scraper, it carries up to 15 cu. yds. per load at these speeds. It can maneuver in tight cut, fill or haul road situations.

Do you need a wheeled tractor with power and exceptional lugging ability?

The DW15 is your answer! Its new 150-HP diesel engine is matched to its weight and capacity. Its heavy-duty clutch and transmission match the engine. Engine, clutch and transmission are designed and built by one manufacturer.

Do you need a unit that will produce all day without exhausting operators?

The DW15 is your answer! The hydraulic booster makes steering easy . . . only eight pounds of steering effort are needed. Air-boosted flywheel clutch, constant-mesh transmission, large-capacity air brakes, anti-jackknife protection and a comfortable bucket-type seat with hydraulic snubber provide the operator with safe, easy operation.

Do you need a tractor that will give you a profitable day's production, day in and day out?

The DW15 is your answer! Designed and built by Caterpillar, it is available with a complete line of matched units . . . scrapers, bottom dump and side dump wagons.

Call your Caterpillar Dealer today. He'll give you complete details on this new high-production, high-speed earthmoving machine. He'll show you the DW15 in action.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

CATERPILLAR*

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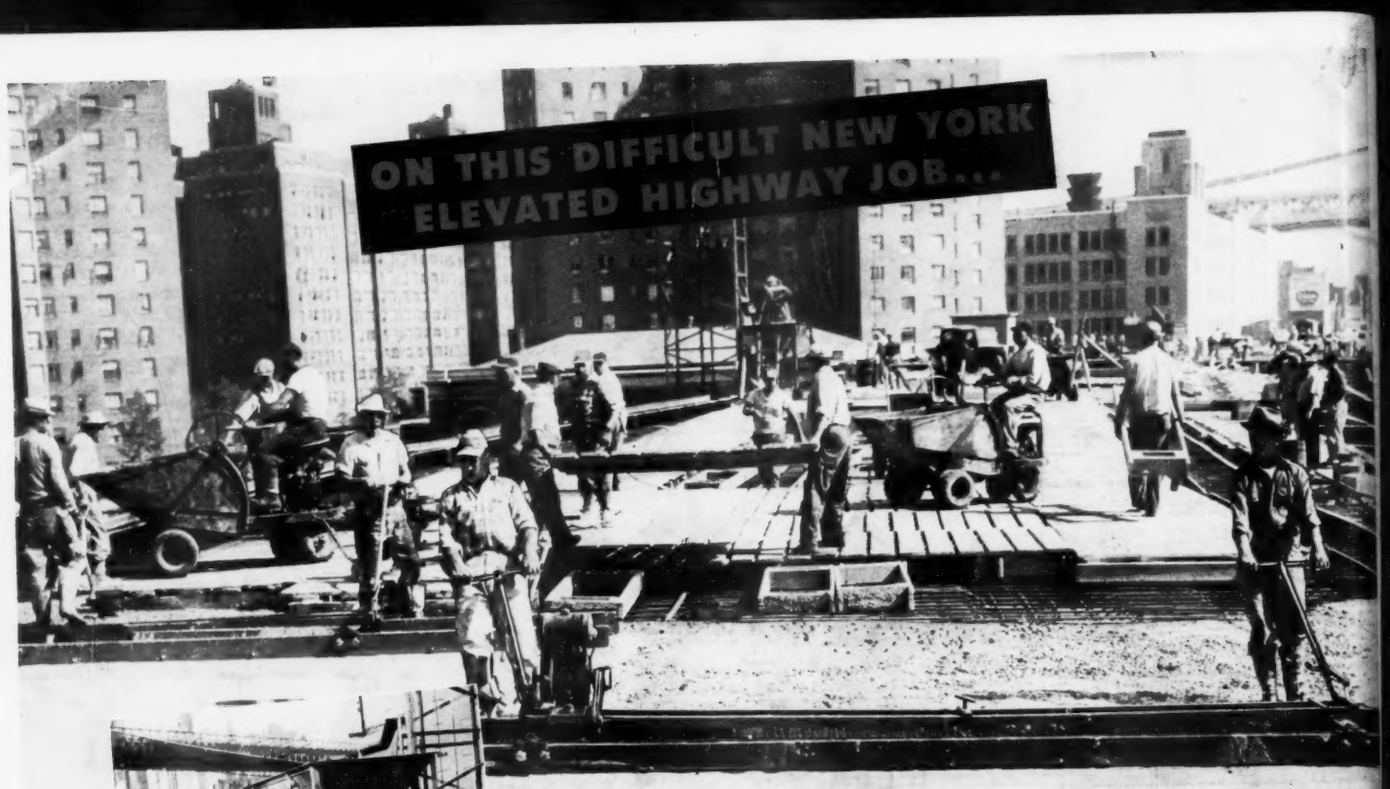
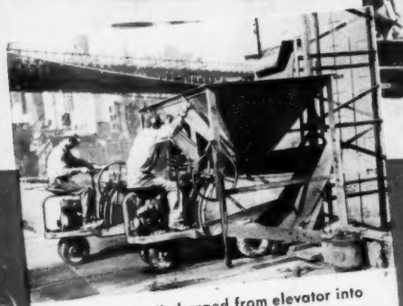
NAME THE DATE... YOUR DEALER WILL DEMONSTRATE





Concrete is discharged from elevator into twin hopper where Whiteman Power Buggies load up.

Power Buggies speed along runways at fast clip, handling average 10 yd. per hour on 300 ft. haul.

Highway deck slab is spread and finished to a perfect level with Whiteman Screeding Machines.

4 Whiteman POWER BUGGIES & 2 SCREEDING MACHINES HANDLED

215 YARDS OF CONCRETE PER DAY!

A tough assignment . . . delivering and pouring concrete for a highway 23 to 31 feet above heavy traffic. Yet it was done smoothly, efficiently on Manhattan's East River waterfront through the use of Whiteman Power Buggies. Operating over portable wood runways, four Power Buggies handled from 180 to 250 cu. yds. of concrete in a 5 to 6 hour period, averaging better than 40 yds. per hour on an average 300 foot haul.

Spreading and finishing concrete for the highway deck was done in record time by two Whiteman Screeding Machines* covering a 37½ ft. wide slab pour . . . saving time, compacting the slab, bringing moisture to the surface and screeding to a perfect level.

Whatever your problems in placing and finishing concrete, call your Whiteman distributor for helpful information.

** Approved by New York State Highway Engineers*

General Contractor: Felhaber Pile Co. Subcontractor for concrete deck: Euclid Contracting Corp.

Whiteman

THE LEADER IN CONCRETE EQUIPMENT

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Please send prices, literature and name of distributor for ☐ Screeding Machines. ☐ Power Buggy ☐ Floating Finishing Machines.

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City_____ Zone____ State____